UNIVERSITY
NEWS

VOL. XXXI DECEMBER 13
No. 50 1993
Price Rs. 5.00

A Weekly Chronicle of Higher Education published by the Association of Indian Universities

IN THIS ISSUE

From 'Ivory Towers' to 'Dreaming Spires' 1
Women and the Educational Development Process 3
Writing Subject-Specific Composition 5
Psychology : The Science of Many Faces 13
Convocation
Avinashilingam Institute for Home Science and Higher Education for Women, Coimbatore 16
Campus News
GNDU Celebrates Foundation Day 21
Changing Views of the Universe 22
Seminar on New Education 23
Bioinformatics Centre 24
Agriculture
Indian Pharmacological Society Meet 26
News from UGC
Countrywide Classroom Programme 27
News from Abroad
Computer Software Substitutes Human Blood 28
Theses of the Month 29
Current Documentation in Education 31

Opinions expressed in the articles are those of the contributors and do not necessarily reflect the policies of the Association.

Editor :
SUTINDER SINGH

From 'Ivory Towers' to 'Dreaming Spires'
The Changing Role of Universities

K. Venkata Reddy*

Right from the beginning, the object of universities has been the transmission of the hard-won knowledge and wisdom of the past to succeeding generations as well as the discovery of new knowledge and new wisdom that would raise man's status. Thus, universities have been geared to liberate human minds, stir the imaginations and cultivate the sensibilities of individual human beings.

The purpose of university education has been the enlargement of individual opportunity and enrichment of individual life. One went to the university to better oneself. Whether it also enriched the lives of others and contributed to community welfare was incidental, and depended on the uses to which the individual graduate or postgraduate put his knowledge and learning. By and large, the university in the past has suffered from too much detachment with the result that it had little impact on the work-a-day world.

Within the last few years, however, we have entered on a new dimension in the relationship of the university and community. The intensified application of technical and scientific knowledge to human affairs has made immense contribution to productivity and material welfare. This has brought about a breathtaking rate of social change which alters the relationship of the university to the community in many ways.

The university has to be a public service institution. Who goes to a university and what is taught there have become matters of much wider public concern than ever before. The individualistic age has ended and given rise to a collectivistic age. All sorts of goals are now determined collectively instead of being left for individuals to discern and achieve.

Furthermore, the universities which are inescapably dependent on large government grants for operating purposes will have to come to terms. Coming to terms, however, does not mean governmental control of what is taught in universities and how. The universities must be able to retain enough freedom about the way in which they study and teach the subjects they must teach. For instance, a university may be obliged to educate doctors or produce engineers, but be left free to decide what to teach them and how.

Thus, social pressures, on the one hand, and governmental influence, on the other, have resulted in bringing the university and the community to closer relationship than ever before. So, the universities could no longer be mere seats of learning. They are answerable to the public.

The universities should exert a vital influence on society. The way to have a vital role in a society is to be immersed in it, subjected to its

---

Deptt. of English, Sri Krishnadevaraya University, Anantapur - 515 003.

pressures, and be sensitive to its deeply felt needs. Utter detachment from the hustle of one's society is a resignation from life, wanted only by those who shrink from facing life. The ivory tower which has been an imposing structure on Indian universities is now to be shattered to pieces. Insofar as the ivory tower is a rejection of all concern with the matters that agitate the society of the day, we can say that its fate is sealed.

We can forget about the 'ivory towers' but must, at all costs, preserve the 'dreaming spires' which are symbolic of high, unhurried and contemplative thought. It would still be possible for penetrating and fertile minds to withdraw periodically from all the clamour of the immediate for thought and reflection on the things they themselves think worth pursuing. The University Professor's public service role should also permit him to persist in unpromising lines of inquiry such as the splitting of the atom was once popularly believed to be, or to pursue other seemingly unprofitable inquiries in literature, philosophy and history. In spite of his commitment to the community welfare, the University teacher shall have time for independent study of his subject so as to ensure that he keeps himself alive in it.

To sum up, in a developing country like India, if there are to be universities worthy of the name, they should bid farewell to their 'ivory towers' and be oriented to community development, preserving at the same time their 'dreaming spires'. Their resources and dispositions must encourage thinking of this order. For, from it alone comes all the winning of genuinely new ground for the map of knowledge and the insights that make classrooms and laboratories stirring places.

CALENDAR OF EVENTS

Proposed Dates of the Event	Title	Objective	Name of the Organising Department	Name of the Organising Secretary/ Officer to be contacted
January 3-21, 1994	Winter School on Logic Programming and Related Topics	To present advanced level developments in Logic Programming	Indian Statistical Institute, Calcutta	Mr K. Sikdar Coordinator, Winter School on Logic Programming and Related Topics ISI, 203 B.T Road, Calcutta 700 035
February 10-11, 1994	National Symposium on Advances in Veterinary Research	Theme . Animal Health and Production	Indian Association for the Advancement of Veterinary Research, Bareilly (U.P)	Dr. T.N Jaiswal, Head, Division of Standardisation, Indian Veterinary Research Institute, Izatnagar-243 122
May 8-12, 1994	1994 Pacific Conference on Distance Education	To share a Pacific perspective of distance education for present and future needs	The New Zealand Correspondence School	Mr. Lorraine Pells, The New Zealand Correspondence School, Private Bag, Wellington, New Zealand
June 1-3, 1994	Seventh Annual Conference of the All India Association for Educational Research	Theme : Innovations in Education	Foundations of Education, Jamia Millia Islamia	Dr (Mrs) G.M. Miyan, Reader, Department of Foundations of Education Jamia Millia Islamia, New Delhi-110025

Women and the Educational Development Process

L.N. Mittal*

The concept of 'Education for All' (EFA) is being elaborated around the following broad topics : 1. Early childhood development, 2. Improving schooling, 3. Improving non-formal education, and 4. Financing quality basic education.

Each of the above themes emphasise (i) Gender equity, (ii) Measurement, and (iii) Innovations.

In a conference of Ministers of Education and those responsible for economic planning in Asia and the Pacific (MENEDAP-VI) held in Kuala-Lumpur the importance of education of women and girls was emphasised to improve their lot both in the formal and non-formal sectors. Very recently in New Delhi in September 1993, the meeting of EFA International Consultative Forum attended by about 20 countries focused on how the governments, NGO's, the business community and local communities can work towards the common goal of (quality basic) education for all. In its declaration the conference said that since women and girls constitute half the population and are deprived of equity in education and, employment in many places, they must receive special emphasis in the preparation of national education plans. The conference also called upon the UN to place on the agenda of the forthcoming World Conference on Women, the issue of women & girls' education with emphasis on access and equity.

It has been emphasised at several forums that investment in the education of women & girls is the key to unlocking the doors of social and economic development of women. As girls' education increases the future family size tends to decrease in the present rapid demographic growth, ... we are on a down escalator (to quote UNESCO's DG), and it takes a major effort to stay where we are to check population. The approach to EFA is also closely linked to its focus on poverty alleviation. The disadvantaged groups like rural and urban poor, women and girls, indigenous peoples, street children, refugees and returnees need special attention to provide them education which relates to income generation and gender equality through community participation according to local needs. This will enable them to take development into their own hands.

Education is the basic pre-requisite for the advancement of a nation and society. It is not merely the GNP that determines the development of a society but the enlightened and awakened people with improved quality of life and equitable distribution of resources. Undoubtedly education has to play a very vital role in achieving such qualities for the people of a nation. Therefore, in the formulation of development plans in a socialistic manner more emphasis should be laid on education especially to weaker target groups.

In a developing country like India, one cannot think of achieving a socialistic goal with one third of its population being illiterate. No doubt we have a nicely worded Constitution, a well defined development plan and a very large team of workers for the development of the country. But these efforts seem to be ineffective in achieving the goal of balanced development due to neglect of weaker sections of the society.

One of the major reasons for this failure and disparities in development is that we have not provided education and literacy to a large number of people in the right manner. This situation seems to be more ugly in the case of weaker sections of the society such as scheduled castes, scheduled tribes and more so in the case of women. The 1991 Census reveals that rural female (S.C.) literacy rate is only 8.44% while for non-scheduled caste rural female literacy rate is 21.68%. It is shocking to note that the male-female differential ratio of literacy is also very high.

The following are some pertinent details:

Inequalities in Literacy : 1991 Census

Literacy rate	52.19 %
Males	64.20 %
Females	39.19 %
Lowest female literacy rate (Rajasthan)	20.84 %
Highest female literacy rate (Kerala)	86.93 %
Male female difference in literacy rate	25.01 %
Sex ratio (female literate per 1000 male literate)	564
Literacy rates Rural	44.54 %
Literacy rates Urban	73.01 %
Rural - Urban difference in literacy rates	28.47 %

Principal, S.D. College, Muzaffarnagar (U.P.)

Scheduled Caste Population	16.73 %
Scheduled Tribe Population	07.95 %

We should also note that the highest literacy rate (of all ages) in India is 91.2 % in Alleppy (Kerala) while the lowest literacy rate is 17.2 % in Bahraich (U.P.). The existing nature of structures of education is not favouring women's interests and it has little relevance and practical value to women. Therefore, for bringing nearly the half of population of the society i.e. women to the national mainstream, it is highly desirable that a new dimension should be given to the educational policies and plans for girls and women.

For the formulation of pragmatic plans, it is essential that the decisions should be made at the grassroot level so that the problem can be tackled in a more practical manner on the basis of empiricism. This strategy seems to be true in the case of imparting education among girls and women more rationally. In the case of national development, educational institutions are the base at the grassroot level and the infrastructure available at this place can be utilised for implementation of programmes of rural development. In an institution, its head is the key person for its functioning, administration and decision making. Moreover, the institutional Head usually happens to be most experienced person in that organisation. With these qualities and position, institutional Head can formulate more realistic plans for educational development of girls and women.

It is generally felt that existing structure of education is not coping with the prevalent societal needs. It is a stereotype structure with total neglect of contents of women's empowerment. Moreover, it has little value in generating jobs and increasing production potential among the people and more particularly among women. The policy makers of the country are actively thinking to remodel the present educational structure and the new educational policy is also under review. Unfortunately, the new educational policy raises only little voice for girls and women despite the tremendous efforts undertaken by the decision-makers at national level. At this juncture a great hope lies with the educational institutions. If adequate resources and infrastructural facilities are provided to the institutions and institutional Heads are given free hand in chalking out the educational development plans for girls and women, one can hope to achieve the primary goal of social justice and gender indiscrimination.

Now the question arises as to what type of education should be given to girls and women that can generate interest among them and can improve their socio-economic capabilities ? What should be the aim and objectives of educational curriculum specially made for girls and women? What type of resources and infrastructural facilities are required for smoothly delivering education to girls and women ? And finally, how to formulate educational development plans for girls and women, its education, execution, monitoring and evaluation ? These are some of the pertinent questions which have attracted attention of educationists, social scientists and policy framers.

An educational development plan must have clearly defined aims and objectives. Besides creating a general awareness for universal education, it should have capability of enlightening pupils to their rights and duties. It is more important in the case of girls and women who are generally deprived of their rights and are victimised by injustices, atrocities and cruelties of men. For the empowerment of women, their economic independence is also essential. Therefore, an educational development plan for girls and women should be formulated in such a manner that the production potential can be generated and women can be made self sufficient by generating enough entrepreneurship among women.

Reforming and restructuring the curriculum of education in accordance with the utility and interest of women is an important task of any educational development plan. In the syllabus of every discipline and the content of every course offered to girls and women, equality of gender is to be emphasised. There may be four types of curricula which are suitable for girls and women :

(i) Courses exclusively formulated for women;

(ii) Courses common for boys and girls but having considerable content of women's interest;

(iii) Vocational courses suitable for girls and women to develop entrepreneurship among them; and

(iv) Development of an independent discipline, namely, women studies.

For the formulation and implementation of educational development plans, institution is a vital factor. It is suggested that in every institution an action group of active teachers should be organised under the leadership of institutional Head with the responsibility of formulation and execution of educational development plans for girls and women. Last but not the least, important is the requirement of infrastructural facilities and resources. These can be arranged by making special provision in different development plans by the state government as well as other funding agencies.

Writing Subject-Specific Composition
A Report on Peer Interactional Feedback

Mitali De Sarkar*
R.K. Singh**

Introduction

The Interactional Process Approach to academic communication in writing at tertiary level, discussed in our earlier paper (De Sarkar and Singh, 1993), is aimed at making students aware not only of the basic elements of composition but also to sensitise them to a three-stage process (of planning, writing, and rewriting) which can trigger their best written responses. The approach, besides integrating writing and reading-for-writing, lays stress on academic skills, style, and form of technical writing and inbuilt evaluation.

It seeks to encourage them to do some research, study and thinking; instead of muddling about the assigned topic they try to start with a planning, a sense of direction, and thus help both themselves and their readers. They learn to concentrate on the *content* without neglecting the *form*. They understand and appreciate the need for clarity, continuity, logicality, coherence, and imagination and *focus* in the development of discussion; they evince a sense of discourse organisation, just as they become *analytical*, *critical* and *creative*, as they look *inward* to their own experience and then respond to their classmates' scripts. The Questionnaire-Cum-Checklist (QCC) as an evaluative tool of the Interactive process stimulates them to action, not only to suggest what to write but also to re-write; it makes them look at the structure and mechanics of the draft essay with an awareness of 'what' and 'how' decisions in the writing process.

Since teaching skills of written communication in English at tertiary level imply teaching the essentials of English rhetoric, the QCC helps to curb their tendency to be formless and disorganised in structuring the essay. We have been aware of the differences between the rhetorical pattern of expression in English and the rhetorical patterns of expression in the mother tongue of our students that often result in non-linear organisation of ideas in expository compositions. Through an inbuilt reading → analysing → writing → feedback → re-writing approach, which enriches their subject and language experience, we try to make them demonstrate a reasonable degree of maturity in style and presentation, learning to appreciate constructive criticism and suggestion which ultimately lead to self-correction and re-writing. In other words, we try to inculcate a sense of *form* and *order* necessary to written communication.

In this paper we propose to examine our students' performance in terms of peer-response (i.e. comments on the draft essay as recorded in the QCC, (Annexures One and Two) and the resultant positive changes in the revised essay. The interactive feedback-process approach, as we followed, has generated a mass of data, some of which we intend to discuss in this paper as part of on-line research.

Planning and Preparation

As reported, we emphasize adequate *planning* and *research* before writing as an essential input to the process approach we practice. Students are asked, for example, to understand the exact scope of the topic, collect relevant information from the library and other sources, and decide upon the best method of development. The reader, in turn, should also be able to see that what he/she is reading is written with a good preparation or with an 'action plan' to realise a particular purpose.

We asked every student to consider whether the composition they had read was written with a preparation or planning. It was heartening to find that over 56% students of Petroleum Engg., about 19% students of Mining Machinery, about 27% students of Mineral Engineering and about 34% students of Mining Engineering did write their compositions with adequate planning. About 32% students (of all the four groups) were judged as having done some amount of preparation before writing.

Yet, we are concerned why as many as 66 (about 29%) students failed to reflect any advance planning in their writing. While Petroleum Engi-

---

*Research Assistant, **Professor Department of Humanities & Social Sciences,
Indian School of Mines, Dhanbad.

neering students seemed to be more serious in writing their assignment, Mining Engineering and Mining Machinery students did not evince the same degree of seriousness, with the result that about 37% students in each of the two groups were found to have written their composition without sufficient planning. As the data show, about one-fourth of the Mineral Engineering students also had composed their essays without adequate preparation.

When we compared the students' response with their first draft, we had an impression that almost every student had some degree of planning and preparation before writing even as we could locate a few scripts that were copied from each other, either fully or partially (perhaps to meet the deadline?) or some students had taken recourse to the same sources, i.e. journal(s), book(s), data (table, chart, graph, diagram etc.), to develop their composition.

As a sequence to peer-response we could discover certain scripts which were totally rewritten with changes in idea structure and development, exploiting additional/new sources.

Idea Arrangement

The Questionnaire-Cum-Checklist provides for individual responses to questions related to logical arrangement of ideas, use of adequate supporting details and examples in the development of ideas, identification of irrelevant ideas which could be deleted, use of cohesive devices and transition words, and appropriateness/appeal of the overall presentation.

The reader-students in *all the four groups* found 'disjointed ideas and insufficient examples' in more than 50% of the first draft. Over 60% students were found to have used irrelevant ideas in their composition, yet about 74% were found to have made their presentation appropriate and appealing, either fully or somewhat. (*cf. Students' response to items 6 and 10 in Annexure Two*).

The peer-response becomes all the more interesting when about 61% students out of the total 228 (52% students of Mining Engineering, 82% students of Petroleum Engineering, 52% students of Mining Machinery, and 55% students of Mineral Engineering) found the idea development in terms of the topic *clear* to them. About 30% students found idea development *somewhat* clear but when it was compared with their response to whether the meaning of each sentence was clear and correct, as many as 50% students from the four groups answered in the negative (*cf. item 8 in Annexure Two*).

We are sceptic about the factors students had in mind while judging clarity of ideas and clarity of meaning in their friends' scripts. If a draft is appealing, it must be clear and correct just as development of ideas should be logical.

As we compared the first draft, and the revised draft of our students we noticed quite a good deal of improvement at various levels, including improvement in idea arrangement. Not only were the difficult and disjointed ideas detected, but also the irrelevant ideas were either dropped or rewritten or replaced in the revised composition. In fact, it was heartening to find more than 85% students showing clear improvement upon their first draft (*Annexure Four*). Most of the students revised it, making changes in the layout and structure, incorporating their reader-critic's suggestions, including new points/non-verbal data, references, sub-topics, and excluding irrelevant sentences and even paragraphs. We also noticed significant changes in introduction and conclusion of many a draft.

Highlighting Techniques

Since the students are asked to write with a sense of readership, the QCC provides for such specific questions as : Did the author use headings/sub-headings in the idea development? and 'Was the idea arrangement (introduction, conclusion, title, headings/sub-headings, graphs, charts, etc.) appealing?' crosschecked with specific problem areas like 'use of tables, charts, diagrams: weak/average/strong.'

From the response recorded we have found that almost three-fourth of the students in each group used highlighting techniques, including headings/sub-headings and non-verbal data that enhance visual appeal of the text, as also help readers follow the logic of the author.

About 54% students (123 out of 228) found the first draft somewhat appealing in terms of informational headings/sub-headings and use of non-verbal techniques, just as 48 students clearly found the first draft impressive in this regard (*item 6 in Annexure Two*). This is also confirmed by the fact that 54 students were rated as *strong* while 75 students were rated as *average*. (*See 15 (e) in Annexure Three*).

We noticed improvement in the *weak* and *average* performers as a consequence of feedback response : these students divided their composition into more paragraphs, placing appropriate sub-headings, adding tables and charts where necessary, and using graphic devices in their revised draft.

However, there were still some students who did not make the necessary changes, despite being pointed out, (in one or two cases even sub-headings also already suggested by the peer), possibly because of carelessness or lack of interest or even understanding of the task required of them ?

Additionally, most of the students who were supposed to reduce the long question (assigned to them for doing the essay) to a suitable heading for their composition failed to do so, possibly because they thought they were answering a question rather than attempting an essay ?

Using Formal Language

Technical students need to use *formal* expression with a sense of objectivity and seriousness both in style and thinking. With the help of QCC student-readers could discover that over 76% of them did not use literary/flowery expressions in their first draft. This means more than three-fourth students wrote their assignment in standard English, avoiding in particular slangs, colloquial expressions, lazy adjectives, uncommon or rare or fancy or even impressive language (that may blind a reader rather than inform him).

We suspect, however, about 19% students who were found by their reader-critics to have used literary or flowery expressions in their scripts *(item 9 in Annexure Two)* may have been awed by their good language, perfectly normal and acceptable in scientific discourse.

It was also pointed out that about 30% students had used sentence fragments or informal language just as about 65% students had avoided such vagaries *(item 13 in Annexure Two)*. This is also borne out by the fact that 139 (out of 228) students were rated as *average* in use of formal expressions *(item 15(c) in Annexure Three)*. About 5% students did not make any comments.

Peer-comments, however, led to positive improvement in the revised draft, even as we noticed a few cases where no improvement or change was made, possibly because the reader-student had not specifically located the flaws such as sentence fragments, etc. on the script, leading the writer-student to believe that there was nothing wrong with his/her expression.

Grammatical Accuracy

As our data reveal, about 59% students had grammatical aberrations of all sorts : subject-verb concordance; tense pattern; use of linking words/transition signals; phrasal construction; choice of words; use of articles, adverbs, prepositions, modifiers, relative clauses; shifted construction such as change from personal to impersonal style, change from indicative to imperative mood, and change from active to passive voice, etc.

About 75% students were found to be wanting in use of appropriate punctuation marks and/or correct spellings. When we ourselves checked the draft, we discovered almost 70% essays grammatically not sound with varying degree of errors including syntactical errors. So much so that about 54% peer-critics recorded grammatical distraction as a specific problem area needing serious attention, though it was disappointing that about 46% students failed or chose not to point out specific grammatical problems either on the draft or on the Q.C.C. *(item 15 (i) in Annexure Three)*.

It was, however, heartening that wherever specific grammatical, spelling or punctuation errors were pointed out, significant improvement was noticed in the revised draft.

We also noticed a few drafts which did not show any changes even if errors were specifically pointed out, just as there were drafts that needed no grammatical corrections and the peer-critics suggested corrections.

Using References

As far as using library sources (reporting, quoting, paraphrasing, or summarising from books and journals, etc.) and acknowledging them in the draft is concerned, almost 64% students were judged to have *not* provided the bibliographic details properly. This is further corroborated by their response to specific problem areas checklist, where they identified as many as 63% students *weak*. Only 7% students were found to be *somewhat* satisfactory in organising bibliography, though 4% students simply ignored recording their observations *(item 15 (h) in Annexure Three)*.

If 60% to 65% students in our study did not provide any references, it could be because either they did not consult the library sources in a significant way to merit acknowledgement of the source of information or they did not record the complete bibliographic information.

As a consequence of peer-review, however, the number of 25% students who had already provided references in the first draft swelled to a significantly high level in the revised submissions: most of the students not only provided bibliographic information but also arranged them in an appropriate form.

Rating/Evaluation by Students

As the students recorded their responses to various points in the QCC, they also gave an overall rating to the composition they had examined. (We may caution the readers that their grading of each other does not reflect their *achievement* as such, rather it is their own *personal* judgement about each other's 'performance' and often at variance with the teacher's judgement).

There was a wide difference between the students' and teachers' perception of Excellent and Very Good performance. For example, in terms of the average response to the problem areas that involve ideas arrangement, use of headings and subheadings, use of supporting details and examples, graphs and charts, use of irrelevant points, grammatical distractions, informal expressions etc., as discussed in the paper, the pattern of evaluation was more or less not at variance with each other though some students seemed to be misjudging or underevaluating their classmates.

While in Mining Engineering, for example, about 19 students on the average were rated as *strong* in their first draft in terms of (a) use of examples to support your opinion, (b) use of cohesive devices, (c) use of formal academic expressions, (d) organisation of ideas in a logical order, (e) use of tables, charts, diagrams, (f) introduction, (g) conclusion, and (h) bibliographical arrangement, about 58 students were rated as *average* and about 45 students as *weak*. This was reflected in their overall rating of the essay too . 2 students were considered *Excellent* and 16 as *Very Good*, 67 students were thought to be *Good* and 37 as *Fair (Annexure Five A)*.

In the teacher's evaluation, only 9 students figured as *Fair* while 82 students as *Good*, 32 students as *Very Good*, and 1 student as *Excellent (Annexure Five : B)*.

The wide difference in the ratings as *Excellent/Very Good/Good/Fair* could be attributed to lack of explanation about the scale of evaluation provided to students or absence of the *same* scale of rating for both the teacher and students, or leaving the judgement entirely to students' own personal/intuitive understanding after critically reading the first draft and recording their observations/responses in the Questionnaire-Cum-Checklist.

Even if the criteria of performance and evaluation/assessment were known, both to the teacher and students, it should make an interesting study in evaluation procedure for communicative teaching of writing. We must admit there was no uniformity in the scale for rating: while the teacher gave marks directly on the students assignments—first draft and final draft—the students were given a rating scale in terms of trade as Excellent/Very Good/Good/Fair, but without any explanation of the marking range for each; the teacher knew his marking range for conversion into grades later; he was aware of his norms, even if he might appear more 'liberal' than the student. However, the number of *Good* essays is uniformly high in students' ratings (in *all* the four disciplines of Mining Engineering, Petroleum Engineering, Mining Machinery and Mineral Engineering) just as the number of *Excellent* essays is uniformly low (*Annexure Five A*).

As we compared the 'performance' of both the teacher and students as far as the first draft was concerned, we had a hunch that students were more critical in rating each other, some of them reticent as well, but generally balanced and reliable. We came across a couple of scripts that also revealed personal bias in rating someone as Very Good/Good/Fair — for, on comparing the observations, responses and rating with the actual script we found a total mismatch.

As we compared the performance rating by the teacher in the fair disciplines we discovered that students of Petroleum Engineering had a higher standard than the students of Mining Engineering, Mining Machinery and Mineral Engineering. In Petroleum Engineering, 45 students (out of 66) were graded as *Excellent* and *Very Good* and none as *Fair*, in Mining Engineering and Mining Machinery only 33 (out of 124) and 14 (out of 27) respectively were rated as *Excellent* and *Very Good*, and 9 and nil as *Fair*. Similarly, in Mineral Engineering group, only 6 students (out of 11) were rated as *Excellent* or *Very Good* and none as *Fair*. (*Annexure Five B*).

The figures compared well with the students' perception among themselves that about 30% students in Mining Engineering and Mining Machinery and about 45% students in Mineral Engineering, were 'Fair' or 'Weak' in their written communication (*Annexure Five A*).

While evaluating the scripts the teacher, too, had the same feeling about the performance level of Mining and Mineral Engineering students vis-a-vis the Petroleum Engineering students.

It also appeared the students' inability to write well did not hamper their ability to judge a poorly written script as is clear from the large number of scripts rated as Fair in each group by them.

Some Observations/Comments

1. The Interactional Approach to writing has convinced us that even if some of the students may not be able to evince a good control over the form and content of their writing, they do become aware

of what constitutes a well written professional/academic document.

2. We could also detect a few students who did not revise the first draft because they were convinced that no revision/improvement was necessary, just as the peer-critics in certain drafts could not suggest any changes or revisions.

3. We also came across a few students whose first drafts were totally/partially copied from each other but were redrafted and revised as a consequence of feedback from the fellow students.

4. Despite positive results we suspect certain reviewers were unable to understand or appreciate implications of various points in the Q.C.C. and, therefore, they were not able to come out with any meaningful observations in their responses.

5. If it were possible to have more time, we would have instituted one more evaluation of students' performance on the revised draft, using the QCC and compared the degree of improvement in terms of the initial and revised composition.

Conclusion

The interactive procedure, to develop academic EST writing skill, as adopted, is innovative/fresh in that it does not consist of routines so familiar to the students. The teacher after each semester can reflect on and analyse the apparent effects of his own teaching and apply the results of these reflections on his future plans and actions. In other words, he can effectively integrate his classroom teaching with research; he can become teacher researcher, even if not supported or encouraged by the system, authorities or colleagues.

Students, too, examine their practices, allow others to examine them *and learn* just as the teacher observes effectiveness of his own teaching practices in the class consisting of heterogeneous group of students. Since there is homogeneity of purpose, i.e. the 'P' of ESP is shared by all and the communicative function of 'E' is the same in all the cases, the individual differences among students/groups ultimately become a positive factor in the teaching learning process.

They read each other's composition to share, add, eliminate, and organise ideas; they write as well as communicate about each other's writing: they identify the writers' purpose, communicative effect, and quality of his/her reasoning and expression; practise outlining; identify inappropriate usages, grammatical distractions, spelling and punctuation errors, sentence fragments and informal expressions; understand appropriateness of the non-verbal data and bibliographical arrangement; and above all, give an evaluative judgement by rating the composition as Excellent/Very Good/Good Fair. They are inducted to revising, editing, and rewriting, giving due weightage to peer observations. The Interactive Process Approach makes them comfortable and confident about academic/research writing, makes them conscious about the expression, the *style* in writing.

References

1. De Sarkar, Mitali and Singh, R.K. (1993) 'Writing for Academic Communication: Interactive Process Approach; *University News*. Vol. XXXI, No. 27, July 5, pp. 8-15.

Notes

i. The records of 228 students' (of 1989-90 and 1990-91 batches) draft essays, their responses to the questionnaire-cum-checklist, and the revised essays — are all available with the Head of the Department of Humanities and Social Sciences, Indian School of Mines, Dhanbad.

ii. All the statistical computation of students' responses and tabulation of data in the Annexures are prepared by the first author while the discussion and interpretation of the data are largely the responsibility of the second author, who had taught the students and executed the process.

iii. The students of IV Semester B Tech 1989-90 and 1990-91 were assigned the following questions for writing the essay:

(A) *Mining Engineering*

'The World Health Organization and our government have been trying to promote better health in rural areas but in mining industrial cities and towns health hazards are growing alarmingly. What possible measures can be adopted to check this? (1989-90). 'Discuss the pros and cons of indiscriminate Coal Mining, upsetting the environmental balance in India' (1990-91) (To reduce the question to an appropriate topic for the essay.)

(B) *Petroleum Engineering*

'Oil and natural gas will run out sometime in the next century. What alternative sources of energy are there and what are the advantages and disadvantages of each ? Discuss the alternative sources with reference to India'. (1989-90 and 1990-91) (To reduce the question to an appropriate topic for the essay.)

(C) *Mining Machinery*

'Do you think mechanisation of Mines in India will improve skills and quality of production? Also, discuss the prospects of complete mechanisation of mines.' (1989-90 and 1990-91) (To reduce the question to an appropriate topic for the essay).

(D) *Mineral Engineering:*

'In spite of huge mineral resources in our country we very often import some of the items. Make out a case to stop this practice in the interest of country's mineral industries and the involved manpower'. (1989-90 and 1990-91) (To reduce the question to an appropriate topic for the essay).

Annexure—One

List of Selected Items from the Questionnaire-Cum-Checklist for Analysis

1. Was the main idea/*idea development* in terms of the topic clear to you?

   Yes/No/Somewhat

2. Do you think the essay was written with a *preparation/planning* in advance?

   Yes/No/Somewhat

3 Did you find some ideas disjointed and/or hard to follow?

   Yes/No/Somewhat

4. Did the author use headings/sub-headings in the idea development?

   Yes/No

5 Were there enough details and examples to support the main ideas?

   Yes/No

6. Was the idea arrangement (introduction, conclusion, title, headings/Sub-headings, graph/charts, etc.) appealing?

   Yes/No/Somewhat

7. Were there any irrelevant points/ideas that could be deleted to make the essay better?

   Yes/No

8 Was the meaning of each sentence clear and correct?

   Yes/No

9. Was there any use of literary/flowery language?

   Yes/No

10. Was the style of presentation appropriate and appealing?

    Yes/No/Somewhat, but needs work

11. Were there any grammatical distractions/problems?

    Yes/No

12. Were there any spelling and punctuation errors?

    Yes/No

13. Were there any sentence fragments and informal-expressions?

    Yes/No

14. Did the author use 'References' appropriately?

    Yes/No/Not needed

15 *Specific Problem Areas Checklist:* WEAK/AVERAGE/STRONG

    a) Use of examples to support your opinion.
    b) Use of cohesive devices (the ideas are related).
    c) Use of formal academic/expressions
    d) Organisation (there is a logical order of ideas)
    e) Use of tables, charts, diagrams.
    f) Introductory paragraph.
    g) Concluding paragraph.
    h) Bibliographical arrangement
    i) Grammar distractions/problems.

Annexure—Two

Peer Response to Selected Items as in Annexure-One

Mining Engineering
124 Students

Item No.	*Yes*		*No*		*Somewhat*		*Not Recorded*	
	No.	*%*	*No.*	*%*	*No.*	*%*	*No.*	*%*
1.	64	51.61	12	09.67	45	36.29	03	02.41
2.	42	33.87	45	36.29	35	28.22	02	01.61
3.	47	37.90	51	.41.12	21	16.93	05	04.03
4.	90	72.58	32	25.80			02	01.61
5.	61	49.19	63	50.80				NIL
6	28	22.58	32	25.80	60	48.38	04	03.22
7.	66	53.22	56	45.16			02	01.61
8.	57	45.96	65	52.41			02	01 61
9.	21	16.93	96	77.41			07	05.64
10.	27	21.77	31	25.00	63	50.80	03	02.41
11.	75	60.48	45	36.29			04	03.22
12.	96	77.41	26	20.96			02	01.61
13.	37	29.83	78	62.90			09	07.25
14.	25	20.16	85	68.54	09	07.25	05	04.03

Mining Machinery
27 Students

Item No.	*Yes*		*No*		*Somewhat*		*Not Recorded*	
	No.	*%*	*No.*	*%*	*No.*	*%*	*No*	*%*
1.	14	51.85	03	11.11	10	37.03		NIL
2.	05	18.51	10	37.03	12	44.44		NIL
3.	08	29.62	13	48.14	06	22.22		NIL
4.	17	62.96	10	37.03				NIL
5.	12	44.44	13	48.14			02	07.40
6.	02	07 40	05	18.51	19	70.37	01	03.70
7.	19	70.37	08	29.62				NIL
8.	13	48.14	14	51.85				NIL
9.	03	11.11	22	81.48			02	07.40
10.	05	18.51	07	25.92	15	55.55		NIL
11.	18	66.66	09	33.33				NIL
12.	17	62.96	10	37.03				NIL
13	05	18.51	20	74.07			02	07.40
14.	10	37.03	16	59.25	01	03.70		NIL

Petroleum Engineering
66 Students

Item No.	*Yes*		*No*		*Somewhat*		*Not Recorded*	
	No.	*%*	*No.*	*%*	*No.*	*%*	*No.*	*%*
1.	54	81.81	01	01.51	10	15.15	01	01.51
2.	37	56.06	08	12.12	21	31.81		NIL
3.	17	25.75	29	43.93	18	27.27	02	03.03
4.	52	78 78	12	18.18			02	03.03
5.	32	48.48	34	51.51				NIL
6.	18	27.27	12	18.18	36	54.54		NIL
7.	31	46.96	33	50.00			02	03.03
8.	35	53.03	30	45 45			01	01.51
9.	17	25.75	48	72.72			01	01.51
10.	19	28.78	11	16.66	36	54.54		NIL
11.	33	50.00	31	46 96			02	03.03
12.	49	74.24	16	24.24			01	01.51
13.	22	33 33	41	62 12			03	04.54
14.	20	30.30	37	56.06	07	10.60	02	03.03

Mineral Engineering
11 Students

Item No.	*Yes*		*No*		*Somewhat*		*Not Recorded*	
	No.	*%*	*No.*	*%*	*No.*	*%*	*No.*	*%*
1.	06	54.54		NIL	04	36.36	01	09.09
2.	03	27.27	03	27.27	05	45.45		NIL
3.	04	36.36	06	54.54	01	09.09		NIL
4.	08	72.72	03	27.27				NIL
5.	05	45.45	06	54.54				NIL
6.		NIL	03	27.27	08	72.72		NIL
7.	08	72.72	02	18.18			01	09.09
8.	06	54.54	05	45.45				NIL
9.	02	18.18	08	72.72			01	09.09
10.	03	27.27	02	18.18		NIL	06	54.54
11.	08	72.72	03	27.27				NIL
12.	08	72.72	03	27.27				NIL
13.	03	27.27	08	72.72				NIL
14	01	09.09	08	72.72		NIL	02	18 18

Annexure—Three

Peer Rating to Specific Problem Areas (Item 15)

Mining Engineering
124 Students

Item No	*Weak*		*Average*		*Strong*		*Not Recorded*	
15	*No*	*%*	*No.*	*%*	*No.*	*%*	*No.*	*%*
a	41	33.06	62	50.00	20	16.12	01	00.80
b	33	26.61	77	62 09	11	08.87	03	02.41
c.	29	23.38	72	58 06	20	16 12	03	02 41
d.	24	19 35	73	58.87	24	19 35	03	02.41
e	62	50 00	35	28.22	24	19.35	03	02 41
f	37	29.83	63	50.80	23	18 54	01	00.80
g.	47	37 90	56	45.16	20	16 12	01	00.80
h	86	69.35	29	23 38	06	04 83	03	02.41
i.	RECORDED :							
	65	52.41					59	47.58

Mining Machinery
27 Students

Item No.	*Weak*		*Average*		*Strong*		*Not Recorded*	
15	*No.*	*%*	*No.*	*%*	*No.*	*%*	*No.*	*%*
a	09	33.33	12	44.44	06	22.22		NIL
b	06	22 22	17	62 96	04	14.81		NIL
c.	06	22.22	14	51.85	06	22.22	01	03 70
d.	13	48.14	09	33.33	05	18.51		NIL
e.	08	29.62	15	55.55	04	14.81		NIL
f.	11	40.74	14	51.85	02	07.40		NIL
g	13	48.14	08	29.62	06	22 22		NIL
h.	14	51.85	08	29.62	05	18.51		NIL
i.	RECORDED :							
	14	51 85					13	48.14

Petroleum Engineering
66 Students

Item No.	*Weak*		*Average*		*Strong*		*Not Recorded*	
15	*No.*	*%*	*No.*	*%*	*No*	*%*	*No.*	*%*
a	18	27 27	28	42 42	20	30.30		NIL
b.	10	15 15	42	63.63	12	18.18	02	03.03
c.	07	10.60	46	69.69	11	16.66	02	03.03
d.	10	15.15	29	43.93	22	33.33	05	07.57
e.	20	30.30	23	34.84	22	33.33	01	01.51
f	14	21.21	31	46.93	20	30.30	01	01.51
g.	19	28.78	31	46.96	14	21.21	02	03.03
h.	37	56.06	10	15.15	13	19.69	06	09.09
i.	RECORDED :							
	36	54.54					30	45.45

Mineral Engineering
11 Students

Item No.	*Weak*		*Average*		*Strong*		*Not Recorded*	
15	*No.*	*%*	*No.*	*%*	*No*	*%*	*No.*	*%*
a.	03	27.27	05	45.45	03	27.27		NIL
b.	03	27.27	06	54.54	02	18.18		NIL
c	02	18.18	07	63.63	02	18.18		NIL
d.	02	18.18	06	54.54	03	27.27		NIL
e.	05	45 45	02	18.18	04	36.36		NIL
f.	06	54.54	04	36.36	01	09.09		NIL
g.	07	63.63	03	27.27	01	09.09		NIL
h.	07	63.63	01	09.09	02	18.18	01	09.09
i.	RECORDED :							
	08	72.72					03	27.27

Annexure—Four

Post-Writing Improvement

Serial No.	*Groups of Students*	*No. of Students in each group*	*Improvement following Peer-Review* Number	*Improvement following Peer-Review* Percentage
1.	Mining Engineering	124	111	89.51
2.	Petroleum Engineering	66	58	87.87
3.	Mining Machinery	27	22	81.48
4.	Mineral Engineering	11	08	72.72

Annexure—Five

A: Students' Rating of the Essays

Groups	*Excellent*		*Very Good*		*Good*		*Fair*		*Not Recorded*	
	No.	*%*	*No.*	*%*	*No.*	*%*	*No.*	*%*	*No.*	*%*
Mining Engineering	02	01.61	16	12.90	67	54.03	37	29.83	02	01.61
Petroleum Engineering	02	03.03	11	16.66	44	66.66	09	13 63		NIL
Mining Machinery	01	03.70	06	22.22	11	40 74	08	29.62	01	03.70
Mineral Engineering		NIL		NIL	06	54 54	05	45 45		NIL

Annexure—Five

B: Teacher's Rating of the Essays

Marks	*Excellent* 7.5 & above		*Very Good* 6.5 to 7		*Good* 5.5 to 6		*Fair* 4.5 to 5	
Groups	*No*	*%*	*No*	*%*	*No*	*%*	*No*	*%*
Mining Engineering	01	00.80	32	25.80	82	66.12	09	07.25
Petroleum Engineering	07	10.60	38	57.57	21	31.81		NIL
Mining Machinery	04	14.81	10	37.03	13	48.14		NIL
Mineral Engineering	02	18.18	04	36.36	05	45.45		NIL

Psychology : The Science of Many Faces

Maharaj Singh*

The term psychology is probably the most commonly used, or at times misused, by the people of all walks of life. The term is also often used as synonymous to 'common sense' and the psychologists are even charged that they deal only in common sense. Nonetheless, it is an interesting discipline which has a very wide scope and its application applies to the very 'understanding of our own system of body and mind' which is used to understand every thing else in the world of knowledge. In other words, the applications of psychology range from as simple as usual common sense to the complexity that we try to understand the most complex amazing 'human brain' and that too by the same brain itself.

Why do people in general often seem to be curious about knowing, understanding or studying psychology? There may be various reasons but one of the common interest in psychology lies in the belief that by studying and understanding psychological principles, it would be possible to read other person's mind. Obviously, this is not true, at least, in the sense what people generally believe. Not only this there are various other interesting questions which come to our mind whenever we think of psychology. For example, can we learn and apply hypnosis wherever we want? Why do people have problems to the extent that they end up losing their sense, and often they are found retreating to their primitive behaviour? Is the use of lie-detection tests scientific? How does rumour spread? Why do males consistently outperform females in mathematical abilities? Do people suffering from mental stress become more vulnerable to immune disorders and to other fatal diseases? All these questions and inquiries along with many other puzzles are related to different areas of psychology and therefore psychologists seem to have great potential for solving some of these problems and thereby influencing our lives for a better tomorrow.

Professor J.W. Kalat of North Carolina State University (USA) in his introductory psychology text even imagined that if some day aliens from outer space will visit us, they would be more curious of knowing the advances in field of human behaviour rather than others in the fields of scientific and technological advances made by men.

Let us look for various faces of psychology and then see what constitutes the real subject matter of psychology or rather scientific psychology. The textbook definition of psychology often stated as 'scientific/systematic study of behaviour and experience' or scientific study of behaviour and mental processes. In turn, behaviour is everything we do that can be directly observed—two people talking, children fighting or a student riding a bicycle. Mental processes, somewhat scientifically vague in defining, describe the thoughts, feelings, curiosity, and motives that each of us experiences privately but that cannot be observed directly. Our feelings, thoughts and motives although not observable, nevertheless exist and are no less real. As a science, psychology, therefore, uses scientific methods such as systematic observations to describe, explain, and predict behaviour.

Many people specially in our country have difficulty in thinking of psychology as a science in the same way as physics, chemistry, and biology is science. Can a discipline that studies the unique phenomenon of language organization in our brain, how people are attracted to one another, how imagery affects memory be equated with disciplines that examine the effect of gravitational force, structure of compound, and the mechanism of the flow of blood in circulatory system? The question arises 'Is science defined by its subject matter or by its methodology?' and the consensus is that science is better known by its methodology and not as much as by its subject matter. Psychology is therefore a science, only if the scientific methods are applied to describe, explain and predict behaviour.

It is not unusual for a scientist to be a skeptical. When we think about ourselves and our world, we can make observations about mind and behaviour : people don't change; environmental influence only works within the limits set by the genetic setup; left handers die young; love is blind; people make their own destiny as they are governed by their own free will; people can train themselves to be more creative, flexible, open minded and adaptive. These are some of the many statements which often spark a psychologist's curiosity and skepticism.

Department of Psychology, Meerut University, Meerut-250 005

There are numerous phenomena often called paranormal (not being in the range of normal experience or scientifically explainable events) which are more common in our country. These paranormal phenomena include 'near death' or out-of-body experience, psychic reading and prediction, communication by brain waves, prophetic dreams, extra sensory perception, ghosts and faith healing, just to name few of the categories.

Among many paranormal phenomena, extra sensory perception has particularly been investigated by the psychologists. Our normal perceptions are based on our interpretation of the sensory information received by our eyes, mouth (taste), nose, ears and skin. Extra sensory perception (ESP), on the other hand, is perception that does not occur through normal sensory processes. The majority of psychologists do not believe in ESPs. According to very few who believe in ESPs, extra sensory experiences fall into three main categories. One is telepathies which is a form of ESPs by which transfers of thoughts take place from one person to another person who is far away. Similarly precognition is another form of ESPs that involves the perception of events before they happen. Another form of ESPs involves the ability to perceive remote events that are not in sight. There is yet another phenomenon 'psychokinesis' which seems to be closely related to ESPs. According to this phenomenon some extraordinary person can acquire control of mind-over-matter and by virtue of which he or she can move objects without touching them, such as mentally getting a chair to rise off the floor or 'willing' a glass to break.

Another very powerful agent which influences our behaviour in many ways and which is more common and acceptable to people in general than ESPs, is astrology. Astrology deals with the description of past, present and future events of the life of one person, a group of persons or even make prediction for particular country, continent or even for whole earth or universe. Astrology interacts with people's behaviour and it sounds a lot like science, it has technical terms, it confuses the public, yet according to many, it is not even close to science.

Interestingly, the mother nature, it seems, deliberately has so far kept two of the most common secrets: one that we are not able to read other person's mind (ESPs); and the second is that we are not aware of our own future (Astrology). Knowledge of psychological principles is believed to deal at least, in part, with both of these secrets of nature. If however we take some moments to think whether normal life is possible after acquiring the ability to read minds and knowing our future, the answer seems to be in negative. The science of psychology, therefore, urges you to be very careful and skeptical of ESPs, supernatural powers, astrological predictions of anyone, or of anything that claims wondrous powers and supernatural presence.

The question, however, remains what constitutes scientific psychology and what makes psychology still an interesting discipline. Psychology as a science received its recognition in the year 1879 with the work of Wilhelm Wundt at his laboratory in Leipzig, Germany. Since then there have been many different approaches to psychology and surprisingly all in some sense, are correct. Some approaches are better for some purposes, but no single approach is right or wrong. Approaches are judged on whether they generate useful information, explain the available observable data and are capable of generalization of the results. The different approaches are applied to describe, explain and predict behaviour and in a way these approaches set the subject matter and scope of psychology.

The major psychological approaches are the behavioural, the psychoanalytic, the humanistic, the cognitive, and the neurobiological approach. The behavioural approach emphasizes the scientific study of behaviour and its environmental determinants. The psychoanalytic approach emphasizes the unconscious aspect of the mind, conflict between biological instincts and society's demands, and early childhood experiences. The humanistic approach stresses a person's capacity for personal growth, freedom to choose one's destiny, and positive qualities. The cognitive approach places a premium on cognitive, or thought process and uses information processing model in psychology. The word cognition comes from the latin word that means 'to know'. In the neurobiological approach, the brain and nervous system play central roles in understanding behaviour, thought, and emotion.

The curious and somewhat philosophical questions such as who we are, and what is our life about, where we have come from, what is our prime objective, and what is going to happen to us, are some of the basic questions for which we use to seek answers and unfortunately psychology of course does not answer these questions, nor did it promise to. Nevertheless, psychology teaches not to accept simple answers to complex questions about how the brain works and why we behave the way we do; it teaches to think critically psychological problems and to handle stress more effectively; it teaches to learn and memorize more effectively and it helps us in understanding people's behaviour which helps in socialization with them.

The evolution of the scientific methods has made psychology segregate from philosophy. However the subject matter of modern psychology has one end tied firmly to biological sciences (genetics, neuroscience, physiology, neurology, psychiatry, etc.), whereas the other end lies in the vicinity of sociology and anthropology. The applied aspect of psychology, therefore, has vast area of application ranging from various therapies for treatment of mental distress, marriage and socialization problems, vocational and school counselling, dealing with organization problems, to areas such as being an ergonomist, psychometrician, and working as social, developmental, cognitive, educational, comparative, physiological and community psychologists.

Apart from this, we often encounter excessive use or at times even misuse of the term 'psychology' along with the discipline psychology. For example, people often make many statements in which many terms of psychology or psychology itself are used without making much sense in terms of scientific psychology. Such vague statements, however, have some face validity, but usually most of them are deceptive. For example, people talk about psychology of women, criminals, sports persons, people working at night, professionals, infants, children, drivers, alcoholics, religion, riot victims, winner and losers and what not. Probably one can add whatever one can think of, yet there cannot be much sense one can make out of these statements. Instead if one can say 'way of thinking' of women, criminals ... along with the 'attitude or way of thinking by people in general' towards the target group or people (and that too in any particular context), one can probably make better sense. Similarly to make better sense many of the fancy psychological terms (jargons) can easily be avoided.

Psychologists are often encountered with interesting and mysterious questions, but at the same time these questions often have very little scientific sanctity. Part of the problem lies in the fact that human behaviour is very complicated as it has had a long evolutionary journey. To add to these complications the same behaviour is extremely variable with respect to within individual, across individuals, and across time and space. In addition to this complexity and variability, psychology also still continues to be motivated by some deep philosophical issues. Some of the most profound questions are free will versus determinism, the mind-body (brain) problem, and the nature-nurture issue.

Scientists dealing with physical and chemical properties of matter often take for granted that everything that happens has a physical cause. Accordingly if we have enough information about a physical object at a given time and space, we can, at least in principle, predict how that object will behave. Turning to psychology and human behaviour, does everything in human behaviour also have a physical cause? According to 'determinism' the answer is 'yes': Everything people do has a physical cause. However, many others believe that human beings possess 'free will', the ability to make decisions that are not explainable in terms of internal or external controls. According to this view, people can decide voluntarily to change their own basic setup. As such the issue of free will versus determinism still sparks interests in psychological researches.

Another psychological problem pertains to the question of the relationship between body (brain) and mind. We know that all our movements and our sensory experiences depend upon the neural activity of our nervous system. These neural activities can be analyzed in terms of the laws of physics and chemistry. We also believe that we have a conscious mind that makes decisions and controls our behaviour. If consciousness cannot be explained in terms of neural activities, there must be mind controlling the matter. The issue is still unresolved.

Similarly, the role of nature (heredity) and nurture (environment) in determining the variations in behaviour, is still debated in psychological researches. There is consensus among psychologists that both heredity and environment play significant role in determining our performance. Heredity, probably sets the limits and environmental factors (such as practice) can make best use of the abilities within those limits. The difference between two people are partly the product of heredity and partly the product of environment.

To summarize therefore, psychology is an interesting scientific discipline which has a great potential for solving the mysteries of nature and thereby making the advancement of scientific knowledge for the betterment of mankind. If we need more attention to understand ourselves, we should pay more attention to the discipline of psychological sciences. It is high time to think of psychology as a science and therefore serious attempts are required to include psychology in the category of science under the broad heading of 'life sciences'. Psychology must also be included in our school academic curriculum. The understanding of psychological principles can help us in knowing ourselves and other people in a better manner which will lead us to have effective communication and to the formation of broad and positive relationships.

Women's Education and Development

Dr. M. Channa Reddy, Governor of Tamil Nadu, delivered the Convocation Address at the fifth annual convocation of the Avinashilingam Institute for Home Science and Higher Education for Women. He said, "The Five Year Plans have consistently placed special emphasis on women's education. Society and administration should aim at neutralising factors which impede the accelerated programme of women's education and consequently their development. Only such education would help eradicate problems of exploitation. Education leads to employment, economic independence and reasonable exposure. Hence the education system should play an effective interventionist role ..... Education of women is basic to the very progress and prosperity of the nation." Excerpts

Education of women has necessarily to be assigned a key role for an accelerated economic growth in any meaningful development strategy. The status and role of women has been subject to many vicissitudes and it is not too difficult to trace the origin of the glorified exploitative mechanism which thrust a domestic role upon women confining them to a narrow and suffocating periphery of socio-economic and cultural frame. Ancient history speaks of women scholars, statesmen and philosophers, followed by the period of the Smrithis when some rights are said to have been denied. This was further intensified by superimposing obligatory values of unquestioning devotion and self-effacement within the family structure later extended to the social context.

Fortunately, in the last 100 or so years various socio and cultural movements have conscientised women against this discrimination and oppression.

Profound changes in science, technology, rapid economic growth, attitude of women towards their own selves and others have caused disturbances in traditional institutions like the joint family, etc. Certain social and cultural values have now become irrelevant. To cope with the onslaught of growth and change which is inevitable, it is essential that women are equipped with the right techniques which build their resilience and enable them to participate in the growth of the country and also to preserve the health and value system that has been handed down to us.

I say this because the multiplicity of roles thrust on women — the wife, the mother, the daughter, daughter-in-law, etc. is taken for granted. Added to that, is the role played in society and economy where different equations have to be created at various levels. The peer pressure a woman now faces is equal in quantum and magnitude faced by men. Writing in "Young India", Gandhiji said : 'Women is the companion of man, gifted with equal mental capacities. By sheer force of a vicious custom, even the ignorant and worthless men have been enjoying a superiority over women which they do not deserve'.

I do not concede that women may differ biologically and in physical prowess. But, seeing as I do, day to day, many women achievers and weak men, I am positive that that factor could also be exploded.

There should always be a link between national growth and women's education. Education should be so structured that the aptitude, skill and intelligence is exercised to the optimum. Majority of women are very far from enjoying the rights and opportunities guaranteed to them by the Constitution.

Even with all this background, I can still confidently state that the Indian woman has succeeded to a large extent in the face of multi cultural changes and multi-pronged superimpositions on her. Suicide rates, break down of marriages, drug addictions though on a rise are still relatively low compared to developed countries. The Five Year Plans have consistently placed special emphasis on women's education. Society and administration should aim at neutralising factors which impede the accelerated programme of women's education and consequently their development. Only such education would help eradicate problems of exploitation. Education leads to employment, economic independence and reasonable exposure. Hence the education system should play an effective interventionist role. It is necessary to counter the forces which seek to assign a role for the women of a lower order and not as equal partners with men. Education of women is basic to the very progress and prosperity of the nation. Our country at the moment is passing through trials on all these fronts and there seems to be a little confusion. It is in the context of these distressing challenges that the educated women can play their considerable part. They have to come out in large numbers and in many important positions and take over more strategic responsibilities apart from the professions as teachers, nurses, etc. It is heartening to note that Ms. Bachedri Pai, the first Indian woman to stand atop the Mount Everest in 1984 and this was followed by other Indian women.

Women had not been inducted in the three Services till 1992. It is a pride for women that a batch of 25 women—the first ever—who have been admitted for training at the Officers' Training Academy, Madras in March 1993, are to be inducted into various branches of the Indian Army. Besides this, 25 young women, all Engineering graduates, mostly from Southern States are undergoing their initial training at the Air Force Training College, Bangalore from May 1993.

On the education front also, the enrolment of women is rising every year. As against 14 women per 100 men in 1950-51, there were 46 women in 1988-89. There has been a notable increase in their participation in all subjects. To cite an example, in the field of medicine and engineering, the participation of women has risen from 16.3 percent to 31.17 percent and from 0.2 percent to 6.2 percent respectively.

In the context of the above background and the importance of female literacy Institutions like the Avinashilingam Deemed University for Women have a very important role, though these may be a few cases in the realm of women's education. It is noteworthy that the objectives of this Deemed University include inculcating ethical values and social and moral standards, to serve as a centre for national integration and to provide opportunities for all-round development of the students and excellence in higher education, research and extension in different disciplines for women. I hope and trust that the Institute will before long, be recognized as a full-fledged Central University

Regarding the University examination, my own feeling is that more emphasis should be laid on the semester system so that continuous interest and study of the students will be ensured. This will in turn, make it quite possible to assimilate the study in a deeper sense. At the end of the year, I would urge that there should be an examination by making available the text books and other concerned books for the students in the examination hall, so that they can use them and write the answers. Only those who have been in touch continuously with the subjects shall be using the books while the others will find it difficult. Academic studies shall only help to form the basis and promote the desire and interest to fully understand and appreciate the subjects, which the students will be able to pursue and apply in their later life.

The basic ideals of the university autonomy without any interference — political, social and administrative have for all times to be preserved at all costs so that the students at their young age can have full opportunity to blossom in a free and fair atmosphere. Selection of teachers is a more important item in which only the standards should be the criterion and should be referred to the University to ensure that the best talents are made available within the State and even outside the State.

The problem of Revaluation needs a fresh look. Neutral monitoring committees must be set up for the redressal of grievances. The faith in brutal marks should slowly yield place to self-awareness on the part of the student. Education is the very harmonious development of one's personality, 'a sound mind in a sound body' to quote Swami Vivekananda.

A university should maintain an Academic Calendar in religious manner adhering to the details in practice throughout the year.

Research is the very basis,the very foundation of higher learning. It helps to create in the mind inquisitiveness and curiosity to learn more and more and create newer things not merely at the students stage but throughout their life apart from enriching the faculty of the subject in which the research is being done. New means of research have to be explored and these must have the bearing on social and regional issues. Research has to be accepted internationally. Research and teaching must go hand-in-hand. One should influence the other Research without teaching is irrelevant. Teaching without research is futile.

There is a growing desirable consciousness on the part of all concerned including the teachers, parents, apart from the students themselves, of the importance of extra-curricular activities like sports, cultural activities, etc. which would help to build the all-round personality of a student so that the student can become an effective citizen and make positive contributions in his life.

I am happy to see so many young faces graduating from this renowned institution, with the ability to face the world — with a positive self-image and confidence — with an education that will lead them into further progress and prosperity. There are many dimensions to a woman's world. It would require a certain amount of skill, patience, sacrifice, maturity and above all self-discipline and the ability to understand themselves and their roles in the right perspectives.

John Ruskin, the famous champion of women's education who showed the way to Mahatma Gandhi in the pursuit of his 'Experiments with Truth' has this thrilling message for you :

> "Oh — you Queens — You Queens!" among the hills and happy greenwood of this land of yours, shall the foxes have holes, and the birds of the air have nests; and, in your cities, shall the stones cry out against you, that they are the only pillows where the Son of Man can lay His head."

Let us not forget the noble conception of Gurudev Tagore, who dreamt of a place "Where the world becomes a nest".

Excerpts from the Report

By

Dr. Rajammal P. Devadas

Vice-Chancellor

Avinashilingam Institute for Home Science and Higher Education for Women

New Courses

During the fifth year of its existence, 1992-93, the University introduced many additional innovations in the already implemented diversification of the under graduate programme with two Major disciplines and two Ancillaries. Examination Reform leading to Total Internal Assessment at the Bachelor's and Master's levels, new question paper patterns, integration of Adult Literacy, NSS and NCC as curricular components bearing academic credit, setting up of question banks and job oriented courses in the degree programmes are the other innovations.

The University also proposes to start Master's Degree Programmes in Business Administration and Performing Arts and Bachelor of Physical Education in the even semester from the currency academic year.

Refresher Courses

Two Refresher Courses of four weeks' duration for Home Science have been planned for this academic year — one in September 1993 and another in January 1994. The first course was attended by 26 participants from 11 universities.

Two Refresher Courses of four weeks' duration have been sanctioned by UGC for Hindi for this academic year. The first course was held in July-August 1993, in Journalism and Modern Hindi Fiction. The next course will be in Indian Culture and Comparative Literature in February-March 1994.

Tamil Nadu Integrated Nutrition Project (TINP)

Since the inception of the TINP in 1980, the College/University has been the training centre of TINP functionaries at various levels. During 1992-93, 154 Community Nutrition Supervisors were trained in six batches. The main focus of TINP is to help the rural women understand the rudiments of health and nutrition and practise them in order to bring about a remarkable reduction in morbidity and mortality rate of infants and preschool age children.

The evaluation of trainees at the mid and end points of the training has indicated that they were equipped well to do their jobs in the field. Performance of the trainees at the field, also indicated that they were functioning very well.

Courses for Anganwadi Workers

In recognition of the Avinashilingam Institute for Home Science and Higher Education for Women as a centre of excellence in education, the Indian Council of Agricultural Research sanctioned a National level Trainers' Training Centre (TTC) in Home Science in 1989. The major objective of the TTC is to conduct need-based vocational skill training programmes for the Home Scientists of the Krishi Vigyan Kendras, housewives interested in self-employment and welfare functionaries of the State and Central Governments.

In the nationwide Integrated Child Development Scheme (ICDS) the Anganwadi is the focus for developmental activities for women and children and the Anganwadi Worker (AWW) holds a key position in the village/slum. The TTC of the University has been conducting Refresher Courses for the AWWs of the ICDS, since October 1991. There are 400 Anganwadis in Coimbatore city. A 15-day training programme is conducted from 1.00 p.m. to 5.00 p.m., daily, for 20 trainees at a time, selected at the rate of five from four ICDS projects. The course covers areas such as preschool education, population education, nutrition and health education, environmental sanitation, community resource mobilization, and demonstration and preparation of income generating products. The training methods followed are group discussions, interactive demonstration, lecture cum small group tasks and dramatization. So far 19 batches of AWWs (382 in all) have completed training, leaving 18 more.

Post evaluation and follow up feed back have revealed a highly positive impact of this Refresher Course.

A further 150 women participants from several organisations were trained in income generating activities. In order to provide alternative care services for the children of working women, a creche has been started in the TTC in the current year.

National Literacy Mission

At present 480 Postgraduate and 212 B.Ed. students, with their staff, are involved in Literacy work under the Community and Social Service Programme. Every day, they teach the adults for 1 ½ to 2 hours in 10 adopted slums of five Divisions of Coimbatore Corporation. The programme is made meaningful and purposeful by linking it with the curriculum. Each student is responsible for making five illiterate people in the age group of 9-45 years, literate.

National Service Scheme (NSS)

Under the NSS, 735 students of the First Year undergraduate classes are taking up the literacy project, teaching two illiterates each by meeting them thrice a week. These undergraduates are working in 10 areas of the Division 28 allotted to the University by the District Collector.

The University has 22 units involving all the 2000 U.G. students. The II and III U.G. students are involved in preschool education working in 52 adopted Anganwadies while the I U.G. and B.Ed. students are engaged in Mass Functional Literacy Programme.

FAO Sponsored Project

The University is implementing an FAO sponsored project on Improvement of Post Harvest Technology in the Rural Areas of Tamil Nadu since September 1992 in which the State Governments, Departments of Agriculture, Social Welfare and Rural Development, assist in the implementation.

The major objective of this project is introducing and strengthening the post harvest technology component into the regular extension service. The work plan of the grass root level functionaries will include post harvest components. Training at various levels is being conducted.

The project aims at reducing the post harvest losses of grains, fruits and vegetables. Processing units for fruits and vegetables will be set up district-wise which would facilitate extending the shelf life of fruits and vegetables and income generation awareness.

Research Projects

The research project on "Exploitation of Microbial Systems associated with Forest Tree Species for the Ecodevelopment of Vivekanandapuram area of Karamadai" was undertaken with the main objective of exploiting the diszotrophs for the ecodevelopment of western ghat region. The nitrogen fixing efficiency of Rhizobium, Azotobacter and VA - Mycorrhizae were tested in leguminous tree species such as *Acacia nilotica, A leucophloea, A. auriculoformis, A. planifrons, A. lebbek, Leucaena leucocephala Cassia siamea, fistula* and *Delonix regia.* The biofertilizers were applied in mixed and monoculture systems. The biometric observations showed significantly increases at 30, 60, 90 and 120 days after sowing. The container grown inoculated seedlings, when planted in the field, increased significantly, the soil nutrient content. The biofertilizers enhanced significantly the growth of the tree saplings.

The project on "Nutritional evaluation of red palm oil" sponsored by ICAR was carried out for a period of 3 years from 6.11.1990 to 5.11.1993 by the Department of Biochemistry. The study included the physico chemical characterisation, animal response and the effect of red palm oil on the levels of plasma lipids and lipoproteins in middle aged persons.

A project on promotion of production and consumption of

B-carotene rich foods is being carried out by the Department of Food Science and Nutrition sponsored by the Nutrition Foundation of India. Under this scheme feeding trials using red palm oil as the cooking medium are carried out. The results are expected to throw light on the ability of red palm oil to improve the vitamin A nutrition among 0-6 year old children as well as pregnant and lactating women who are the beneficiaries of ICDS programme.

The project "Operational Feasibility of Incorporating Vitamin A Rich Foods in the Diets of Preschool Children", sponsored by UNICEF is in operation since February, 1993. The main objective of this scheme is to study the operational feasibility of incorporating vitamin A in the diets of preschool children and to evolve low cost locally feasible intervention technology to improve the vitamin A nutriture of preschool children. For this study 100 ICDS centres of Project III in Coimbatore (urban) have been adopted.

The project on "Nutritional Intervention with Low Cost", sponsored by U.S. India Fund & ICAR has been successfully completed in July 1993. In this scheme, children who were given early nutritional intervention with enriched rural rice/ragi based diets from birth through preschool age, were followed up for their nutritional profile, mental ability, academic and athletic performances. Information on the feeding trails with infants/children, with the best two weaning formulations prepared from components of ragi/rice diets, proved to be beneficial in terms of their gain in body measurements which were higher than those of their control counterparts.

The Department of Economics submitted a project proposal to the UGC for financial assistance to study the major problems confronting the Indian banking system and suggest methods : (1) to strengthen the viability of the Indian banking system and (2) to improve the capital base of our commercial banks.

The UGC has now sanctioned the project at an estimated cost of Rs. 1,89,000/- and the project study is estimated to take three years.

The project sponsored by the US Wheat Associates, New Delhi, to popularize wheat and its products has been going on for the past five years. Several new wheat recipes have been standardized. Apart from the result demonstrations conducted for various groups, the members use methods like exhibitions, competitions, display of charts, folk media, AIR and Doordarshan for the popularization work.

Special Assistance Programme

The Special Assistance Programme was sanctioned by the UGC for improving the Faculty of Home Science — the Department of Family Resource Management. The programme is spread over three years. It concentrates on water management, environment protection, fuel management, resource conservation and income generation. Three villages have been adopted and the work is progressing.

Industry-University Collaboration

Our University entered collaboration with Sakthi Soyas Limited in December 1992. Under this scheme, popularization work with defatted soya flour — VIGOUR — is in progress. Research efforts of the Food Science and Nutrition Department on 500 preschool children in Coimbatore, proved beyond doubt the efficacy of the soya flour in promoting the nutritional and health status of children. As a result, the Government of Tamil Nadu is at present providing 50 percent defatted soya flour in the place of red gram dhal in all the nutritious noon meal centres of Tamil Nadu. Under this scheme defatted soya flour is also being popularized among the public through result demonstration of soya based recipes and by participating in exhibitions, using folk media and so on.

BARC Symposium on Solid State Physics

As the communications from the delegates to the Symposium on Solid State Physics being organised by the Bhabha Atomic Research Centre (BARC), Bombay on December 27-31, 1993 stand disrupted due to postal strike, BARC would like to request the Heads of Physics Departments in Indian Universities to intimate to them the names of participants through Telex/Fax or Courier Service. This will help them make necessary arrangements with regard to accommodation, symposium material, etc. Their Telex Nos. are 011-71017 BARC IN and 011-72322 BARC IN. Fax No. is 022-556 0750.

Forms sent to all first authors may be returned by Courier Service or Speed Post whichever be functional.

GNDU Celebrates Foundation Day

Mr. Lakhmir Singh Randhawa, Education Minister, Punjab while presiding over the 24th Foundation Day celebrations of the Guru Nanak Dev University said the universities today had a crucial role to make the society enlightened. Besides imparting knowledge, the educational institutions should inculcate social and moral values amongst the students, to make them better citizens.

Mr. Randhawa said the Punjab Government had decided to vocationalize the education in the State from primary to graduate level. He asked the Vice-Chancellor Prof. Gurdip Singh Randhawa to send the proposals to the State Government for this purpose. The Education Minister said Punjab was agro-based State and the Government was trying its utmost to industrialize it. Some steps had already been taken in this direction.

Prof. Gurdip Singh Randhawa, Vice-Chancellor, in his welcome address gave details about the various vocational courses introduced by the university. He said the university had also started interaction between the university and industrialists to take the benefit of each other's expertise.

The university on this occasion arranged two academic lectures by Dr. Jodh Singh, an eminent Sikh scholar and Professor of Religious Studies, Punjabi University, Patiala on the life and teachings of Guru Nanak and by Dr. Satinder Singh, Professor, School of Punjabi Studies of the Guru Nanak Dev University on "Development of Punjabi Language and the Problems of Medium Switch Over".

Dr. Jodh Singh in his lecture while analysing the role of religion in secular as well as spiritual life of man emphasised the fact that the theology created by Guru Nanak was not only all embracing and penetrating but a distinct and altogether fresh one. The reasons behind this, he said, were not far to be seen. Guru Nanak in fact never hesitated to meet Mullah in his Mosque, Pandit in his temple and Yogis in their Hide-outs of Jungles and caves. He was in constant dialogue with the masses on the one hand and with elite class on the other. Single handedly, he grappled with social and religious hypocracy of the time and his message became the nucleus of Khalsa created by Guru Gobind Singh.

Dr. Jodh Singh was of the view that dialogue was the main tool in the hands of Guru Nanak and his "ONKAR" and "SIDHA GOSHTI" were such longer hymns incorporated in the Guru Granth Sahib which exposed before us the true spirit and structure of dialogue. He further stressed that in view of the prevailing circumstances and degradation of values of life, unbiased religion and meaningful religious studies could provide a common platform for all to come together and live blissfully.

In his lecture, Dr. Satinder Singh said Punjabi was a refined modern Indian language, having rich literary and cultural heritage. It received patronage not from the State but at the hands of Pirs, Fakirs, Gurus, Prophets and Bhagatas. Adi Guru Granth is a Sacred Scripture, which epitomize its philosophical depth and richness of expression, he added.

Dr. Satinder Singh further said that today Punjabi was a medium of instruction both at college and university level and there were many departments and institutions working to cater its various needs for few decades. He said this was now the right time to thoroughly assess and evaluate the work done by these agencies.

Dr. Satinder Singh suggested that there should be a graded teaching of Punjabi from primary to university level. Punjabi Language should not be made difficult and terse and it should be kept close to its old sweet and soft flavour. All these problems needed thorough evaluation and assessment from academic point of view, he added.

Science Policy Review Urged

The Union Government should incorporate science and technology as integral part of the development process to ensure that India emerged as a competitive nation in the changing economic scenario, said Dr. C.N.R. Rao, Director, Indian Institute of Science (IISc), Bangalore. He was delivering the inaugural address at the 63rd annual session of the National Academy of Sciences in Bangalore recently. He said a well orchestrated policy was necessary to meet the changing geopolitical and economic situation and to see that the country competed with others. Such a policy should include stepping up funds for research and development laboratories in order to help them develop technologies for the Indian industry. But if the quantum of funds provided to such laboratories continued to dwindle a situation being witnessed now, the existing "minimum infrastructure" and expertise would be wiped out in a couple of years.

He suggested that the Government could resort to critical funding in selective areas such as bio-organic chemistry and inorganic chemistry. The country could emulate Japan's proposed ambitious solar panels (using amorphous silicon) project through which it planned to reduce the cost of power generation by one-tenth. The Indian government could fund research for meeting the domestic needs.

Prof Rao was critical of the new attitude among bureaucrats who felt that higher educational institutions and R and D Laboratories should earn funds on their own. If this attitude continued, the laboratories could meet the fate of those in Russia and Hungary and the magnitude of the gap between science and technology in India and other countries would widen. "No foreign government or industry will give us the latest technology. We will get out-dated technology at expensive rate and with many conditions."

He said the academy should ponder over why the country could produce only a handful of excellent scientists. This was also true with laboratories carrying out world-class experiments. "Leave out four institutes and some scientists and Indian science is nil". The S and T institutes were facing a piquant situation — funds would not be forthcoming unless the quality of work improved, while to improve the quality of work funds were necessary.

Mother Teresa Varsity Convocation

Delivering the sixth convocation address of the Mother Teresa Women's University, Madras, the Vice-Chancellor of SNDT Women's University, Bombay, Dr. Suma Chitnis, regretted that "commercialisation" had crept into higher education which was also being dogged by vested interests of politicians and bureaucracy. She wanted all universities to come forward "boldly and bravely" to save the present appalling state of higher education.

Universities, Dr. Chitnis said, were loosing their authenticity, rigorousness and relevance, "pushed by the vested interests of politicians, crippled by the complex bureaucratic requirements, harassed by the demands of faculty and non-academic staff unions, and burdened by an inertia as a majority of students come for degrees rather than for knowledge."

She said women's university had to advance women's education and their status in society in a way that a co-educational university could not.

Listing out some of the urgent tasks for women's universities, Dr. Chitnis suggested development of professional and semi-professional courses which would be suited for self-employment of women and to have some facility so that women, whose education had been interrupted by motherhood or marriage could resume the courses.

Tracing the inception and growth of the SNDT University since its inception in 1916 by Maharshi Karve, she hoped the postgraduates of Mother Teresa Women's University would imbibe this motto in true spirit.

The Governor and Chancellor of the University, Dr. M. Channa Reddy, who presided, gave away the doctoral and masters degrees.

Dr. (Miss) S. Lakshmi, Vice-Chancellor of Mother Teresa Women's University, in her welcome adders said the postgraduates of the university formed the strong pillars for women's growth, prosperity, equality and excellence.

The university, she said, had good academic courses and research fields as well as facilities for computer courses. She said the programmes were need-based and job-oriented.

She said the university had taken up several research projects relating to women studies, including violence on women, an interdisciplinary project sanctioned by the University Grants Commission.

Changing Views of the Universe

"Man has, since the dawn of civilisation, reflected deeply on the mysterious universe around and achieved a breakthrough in silent study," said Dr. B.G. Sidharth, Director-General, B.M. Birla Science Centres and Planetariums. He was delivering the inaugural lecture on 'Changing Views of the Universe' at a function got up by the Warangal Regional Centre of Andhra Pradesh Akademi of Sciences recently.

Dr. Sidharth traced the history of man's quest for astronomical knowledge hidden in the stars and planets right from the early Sumerian and Babylonian civilizations to the present day. He gave a graphic account of the most modern achievements in the field of astronomy which had changed our views of the universe as a whole.

Referring to the contribution of ancient Indians to astronomy, Dr. Sidharth deplored the fact that a great deal of scientific knowledge was either lost or merged with symbols, myths and images which were not easy to decipher today. He therefore stressed the need to make a serious study of ancient contribution which might give clues helpful to modern research.

Speaking on the occasion to mark the inauguration of the activities of Regional Centre for the year 1993-94, Dr. K. Jayashankar, Vice-Chancellor of Kakatiya University, said that the scientists and the scientific organisations had the responsibility to translate research findings in the language of the common man to convey the message of science. He complimented the Warangal Regional Centre of A.P. Akademi of Sciences for organising meaningful programmes under the 'Science for the Citizen' lecture series.

Prof. Dinker Sirdeshmukh, Dean, College Development Council of Kakatiya University, who presided, said that the Regional Centre was planning to arrange lectures on the subjects like nutrition, polymers, ecology and the Latur earthquake.

Seminar on New Education

Kurukshetra University, recently organised a one-day seminar on 'New Education' under the auspices of Sri Aurobindo Centenary Celebrations. Professor S.P. Malhotra, Director of the Seminar, in his opening remarks, apprised the delegates about the objectives of the seminar. He said that Sri Aurobindo's philosophy had great relevance to education system of the country especially at the time when the educational system was at crossroad. He stressed the need for self-education and integral Yoga as propounded by Sri Aurobindo.

The Governor of Haryana and Chancellor of the University, Shri Dhanik Lal Mandal, who inaugurated the seminar, said, "the Education is 'Sadhna' which means total dedication and devotion. Sri Aurobindo wanted to make the student a 'Sadhak' who is self-disciplined and is able to feel the glow in him. This comes through the evolution of consciousness and concentration". The educational institutions, he said, should inculcate in students the power of concentration. Even Sri Aurobindo himself had developed the power of concentration. It was so strong in him that he could read one hundred pages in half an hour and reproduce the same in verbatim. "Concentration helps in perfecting the mind as an instrument of education. The perfection comes when one is able to understand the things well. Mother tongue is the only source which helps in training the mind. The mastery of mother tongue is a necessary pre-requisite to any regular subject of study." The universities should stress on mother tongue as a medium of instructions. Another aspect of Sri Aurobindo's education was that he wanted that each student should be a Yogi who practices Yoga in an integral way. That is, he should integrate his physical, mental and spiritual development. The objective of Sri Aurobindo was to create a society consisting of divine people. This could be achieved by educating each person in the society. In the present day of moral crisis only education could help to retain the values. Our educational institutions should try to bring in the reforms as suggested by Sri Aurobindo, he added.

Prof. Bhim S. Dahiya, Vice-Chancellor of the University, who presided, said that the Kurukshetra University was open to bring in all possible reforms in its educational system. The University did not only mechanically want to adopt Sri Aurobindo's reflections on Education, but it had an objective to create integral cultivation of body, life, mind and spirit. He added that university had plans to prepare in a systematised manner the seasoned minds. We started Yoga centres so that students could practice Yoga to develop concentration and integrate their experiences.

Over eighty participants from Punjab, Haryana, Himachal Pradesh, U.P. and Union Territory of Chandigarh participated in the seminar.

Drug Development Meet

A three-day National Seminar on Heterocyclic Compounds in Drug Development was recently organised by the National Academy of Chemistry Biology (India), Department of Chemistry, Luck-now University. Prof. M.S. Sodha, Vice-Chancellor, Lucknow University, speaking as chief guest, emphasised the need for development of new drugs to combat parasitic diseases, the scourge of mankind living in tropical countries, like Malaria, Filaria and Kala-azar. He commended the efforts of the Academy to concentrate in the field of heterocyclic chemistry, an important component of drug research.

Prof. V.K. Ahluwalia, Professor of Chemistry at Delhi University & former Vice-Chancellor, Manipur University, in his keynote address indicated that vital drugs to control infectious diseases like typhoid, paratyphoid, helminth infection and cancer could be obtained through the agency of heterocyclic compounds. He further said that heterocyclic compounds held great promise to control AIDS.

Prof. S.P. Hiremath of Gulbarga University presented his research work on development of drugs for leprosy. Heterocyclic compounds such as indoles and hydroxy indoles were found to be significantly active antileprotic drugs.

He hinted that some of his compounds were undergoing final clinical trials and a new breakthrough was expected soon in the field of anti-leprotic drugs.

Prof. H.M. Chawla of IIT, Delhi discussed his research work on clonidine, a potent heterocyclic hypotensive drug for the treatment of hypertension, a silent killer. Dr. Noel J. De Souza Hoechst India Ltd. Bombay was of the opinion that drugs from natural products were far more effective. However to obtain drugs from natural resources a close interaction with chemists, botanists, pharmacologists and medical professionals was a must, he added.

Prof. Jag Mohan of M.D. University, Rohtak demonstrated that condensed heterocyclic systems containing thiazole could be successfully employed to control parasitic infections. According to Dr. R.S. Varma, the organising Secretary of the seminar the incidence of helminth infections is alarmingly high in tropical countries like India. Researches carried out by Dr. Varma and his group at Lucknow University have resulted in the development of new heterocyclic compound LU/MS-53 which is effective as a broad spectrum antihelmintic agent.

For effective chemotherapy of malaria an endemic parasitic disease it was important to understand the life cycle of causative organism plasmodia, in human host, was the view advanced by Prof. V.M. Reddy of Kakatiya University.

An indigenous herb known as Brahmi according to Dr. D.K. Kulshrestha of CDRI is highly valued as a nervine tonic in the traditional system of medicine. Ethanolic extract of the herb containing saponins called bacocides was found to improve the performances pertaining to memory & learning.

A new lead to antifilarial drugs development was reported by Dr. Som Nath Singh of CDRI in the form of cyclic guanidins.

The concluding session of the seminar was presided over by Prof. E. Venkata Rao of Andhra University, Visakhapatnam.

The Academy is also associated with an international journal viz "Indian Journal of Heterocyclic Chemistry".

Pondicherry University Bioinformatics Centre

The Distributed Information Sub-Centre (Bioinformatics) at Pondicherry University, established by the Department of Biotechnology, Govt. of India in 1991, is addressing itself to the growing need of Biotechnology information of large spectrum of scientists working in different areas of biotechnology in Pondicherry University, Jawaharlal Institute of Post Graduate Medical Education and Research, Vector Control Research Centre, French Institute, postgraduate colleges and the industrial corporations in and around Pondicherry.

The Centre has established offline information and online information from DICs and other centres to meet the end user's specific requirements. The centre is receiving information from other DICs which is facilitated by using modems and facsimile system.

The activities of the sub-centre are providing information to end users through hardware and reprographic facilities at the centre, organizing information dissemination services including data retrieval development in relation to and cooperation with DICs and other information centres in building up resource databases/information sharing in the related areas of biotechnology.

Refresher Course on Criminology and Forensic Science

The National Law School of India University (NLSIU), Bangalore, recently conducted a three-week Refresher Course on 'Criminology and Forensic Science'. The course was inaugurated by Shri D.K. Sampath, Advocate, Chengalpat, in which 40 teachers, representing 9 states and 1 union territory participated.

The course was divided into 3 modules, viz., (1) Criminology and Criminal Justice Administration; (2) Forensic Science; and (3) Victimology and others.

The topics in the first module were : (i) Criminology, Penology and Criminal Justice in Indian Legal Tradition; (ii) Criminology

Teaching and Research : An overview; (iii) The Crime Problem : Panel Discussion; (iv) Criminal Justice System : Policies, Priorities and Performance; (v) Human Rights and Criminal Justice; (vi) Sentences and Sentencing; (vii) Prison and Prison Administration; (viii) Corrections and Correctional Administration; (ix) Police : Organisation, Administration and Accountability; (x) Police and Criminal Justice; (xi) Juvenile Delinquency and Justice System; and (xii) Public participation in Criminal Justice System.

The second module included: (i) Forensic Science and its application; (ii) Forensic Toxicology; (iii) Forensic Ballistics; (iv) Forensic Psychiatry; (v) Forensic Genetics; (vi) Forensic Science : Application in socio-economic offences; (vii) Forensic Engineering; and (viii) Forensic Expert in Court proceedings : Panel Discussion.

The third module consisted of : (i) Victimology : Scope, Concerns and Policies; (ii) Issues on Victimology; (iii) Criminal Justice— Policy and Planning; (iv) Crime prevention through Yoga and mediation; (v) Socio-economic offences and Criminal Justice System; (vi) Terrorism and Criminal Justice; (vii) Women and Crime, (viii) Drug Trafficking and Addiction; and (ix) Alcoholism and Responsibility in Crime.

VC Visits Prison Study Centre

48 prisoners put up in the Rajahmundry Central Prison are attending various courses of Dr. B.R. Ambedkar Open University. The Vice-Chancellor of the Open University, Prof. S. Bashiruddin, recently visited the Study Centre that functions inside the prison to discuss problems with them. The prisoners between 20-40 years of age now enrolled for the undergraduate courses are also reported to be keen on availing of postgraduate courses introduced by the university this year.

Sri. K. Krishna Murthy, Superintendent of the Rajahmundry Jail said that prisoners were profitably utilising their time to study the open university courses. The Vice-Chancellor assured more intensive counselling facilities and timely delivery of the reading materials to the inmates as desired by them.

The Vice-Chancellor also announced that the university would be introducing postgraduate courses in M A (Political Science & Public Administration); M.Sc (Mathematics) and MBA from the ensuing academic year.

IGNOU Plans PG Diploma in Computer Applications

The Indira Gandhi National Open University (IGNOU) proposes to launch Post Graduate Diploma in Computer Applications (PGDCA) with effect from July 1994. The eligibility criterion for admission to this programmes is graduation in any stream, and admission will be made through an entrance test. The entrance test will be held at the 16 existing Regional Centres of the University on February 27, 1994.

Students who complete this programme would be able to take further courses from the University, as the 'Advanced Diploma, and finally a 'Masters in Computer Applications'. They could continue to hold jobs while pursuing these programmes.

100 Books for Neo-Literates

Dr. A.N.P. Ummerkutty, Vice-Chancellor of the University of Calicut, said the University would publish 100 books with the main objective of providing reading materials to neo-literates in Kerala. He recently released the first 15 books in the series, by giving the first copies to Mrs. Khamarunnisa Anwar, noted social activist and chair person of the Kerala State Social Welfare Board. The Vice-Chancellor said that the aim of the literacy movement should be to prepare the people for the developmental activities. It was with this objective that the University proposed to publish more books on various subjects like Agriculture, Industry, Poultry, History, Public Health etc, he said.

The book releasing function was followed by a one-day Seminar on Continuing Education and Development which was inaugurated by Prof. V.J. Pappoo, Pro-Vice-Chancellor of the university.

Orientation Programme on A-V Materials

"The importance of Audio Visual medium in distance education though well recognised requires communication skills on the part of academics in presentation of the contents", observed, Prof. S. Bashiruddin, Vice-Chancellor, Dr. B.R. Ambedkar Open University while inaugurating a two-day Orientation Programme on "Development of Audio Visual Materials: Academics-Producers Interface" in Hyderabad recently. The Vice-Chancellor stressed the need for imagination and quality in production of video lessons to integrate with the syllabus keeping in view the target audience.

The Orientation Programme was jointly organised by Audio Visual Production & Research Centre (AVP&RC) and Centre for Staff Training and Development (CST&D) of the University and was attended by about 60 participants including the faculty and deputy directors, assistant directors and co-ordinators of the study centres.

Vocationalisation of Education

A UGC sponsored seminar on Vocationalisation of Education, Adult Education and Female Education was recently organised by the J.V.M.G.R.R. College, Charkhi Dadri, Haryana. Inaugurating the seminar Shri Vivek Sharma, Pro-Vice-Chancellor of Maharshi Dayanand University, Rohtak emphasised the need of vocational education in the modern age of science and technology. He said the vocationalisation of education was the need of the hour. He opined that adult education and female education were must for the all round development of the society.

The two-day seminar was attended by over hundred scholars from different schools, colleges and universities of Haryana. They highlighted the importance of vocationalisation of education, adult/female education in the various technical sessions.

Ambedkar Chair at Madras Varsity

The Dr. Ambedkar Foundation in the Union Welfare Ministry proposes to establish Chair in the department of economics in the Madras University to disseminate the ideals and thoughts of Dr Ambedkar, the architect of the Indian Constitution.

A memorandum of understanding in this regard was recently signed by Mr Ganga Das, Joint Secretary, Union Ministry of Welfare, on behalf of the Dr Ambedkar Foundation, and Mr P. Govindarajulu, Registrar of the Madras University.

Mr Govindarajulu said the objective of establishing the Chair was to provide opportunities to interested students and academicians to undertake research for understanding, assessing and disseminating the ideals of Dr Ambedkar, especially in subjects like political economy, socio-cultural inequities and religious philosophies.

1994 — International Year of Sport

The General Assembly of the United Nations Organization has proclaimed 1994 as the International Year of Sport and the Olympic Ideal, and Urged Member States to observe an "Olympic Truce" for a week before and after each of the Olympic Games. It took that action on 25 October by adopting, without a vote, two resolutions on building a peaceful and better world through sport. Under the resolution on the Year of Sport, the Assembly invited full participation in the Year by States, non-governmental organizations and the United Nations system.

News from Agricultural Universities

Indian Pharmacological Society Meet

"There is need for growing emphasis on molecular and cell biology to unravel the mechanism associated with several biological affections", said Dr. B. Unvas, a Swedish scientist and former Chairman of the Nobel Prize Committee, while inaugurating the 26th annual conference of the Indian Pharmacological Society at the Chaudhary Charan Singh Haryana Agricultural University (CCSHAU) recently. He said that Pharmacology was undergoing revolutionary changes and new vistas were being opened every day. So it was necessary for the young Pharmacologists to go to the labs and research centres where work was being done on molecular biology, he added.

Dr. S. Arya, Vice-Chancellor, who presided, expressed concern over the pollutions caused at the environmental and human level. He said, "In an effort to have a better living, man has resorted to creation of artificial environment. The chemicals, noise and even tension and anxiety have not only polluted the ambient environment but also to a great extent our internal environment i.e. our mind". He further said, "The continued stress has affected the resistance, vigour and longivity and even human chemicals, we resort, to chemicals and approach physicians. The cost of life saving drugs has increased many folds and probably desirable treatment is out of reach of common man". Dr. Arya called upon the participants and experts to take up intensive efforts so that 'Health for All' could be achieved by 2000 A.D.

On this occasion, Dr. Alladin Ahmad, Deputy Director General (Education) of the Indian Council of Agricultural Research was felicitated and presented a citation and a memento for his "signal contribution to the development of Pharmacology in this country".

Prof. F. Rassmussen from the

Royal Veterinary and Agricultural University, Denmark, in his keynote address said, "Besides the resources from industries and private funds, there is need for providing public resources for basic research in Pharmacology". He urged the politicians in the countries of the world to understand that prevention was better than cure also outside the clinics. Break-down in basic research needed to be prevented. He envisaged that in future there would be a great need for new drugs for pharmacologists to study them because citizens and farmers would continue to demand qualified advice and help. For this, special emphasis would have to be made on receptors, bio-chemical receptor and immuno-pharmacology, he added.

Over 200 delegates from India and abroad participated in the 3-day conference.

Krishak Diwas and Kisan Mela

A series of Krishak Diwas were recently organised by the Directorate of Extension Services of Indira Gandhi Krishi Vishwavidyalaya in different research stations situated in different parts of Chhattisgarh. About two thousand farmers from different parts of Chhattisgarh visited these kisan melas. As a part of the melas, agricultural exhibitions were organised in which the latest agricultural implements, plant protection chemicals, micro-nutrients and irrigation pumps and the recently recommended technology on production of crops were displayed, and explained by the scientists.

Working demonstrations of farm implements with plant protection equipment and agriculture farm implements, were given by the various firms which participated in the exhibitions. The farmers were taken round the experimental fields conducted by the Vishwavidyalaya.

Mr. A.D. Mohile, Commissioner, Raipur Division, who was the chief guest at one of the melas, felt that organising the kisan mela was a good means for transmission of the critical messages to the farmers. He said the farmers should keep pace with time and be fast in adapting day to day changing agriculture technologies. He felt that farmers could improve their economic condition by adopting the multiple cropping system.

Dr. Kirti Singh, Vice-Chancellor of the Vishwavidyalaya, who presided, stressed the importance of cooperation among the different production functionaries and the Agriculture University. He explained the scope of horticulture, dairying, agro-forestry, etc. in Chhattisgarh region.

News from UGC

Countrywide Classroom Programme

Between 15th December to 21st December, 1993 the following schedule of telecast on higher education through INSAT-ID under the auspices of the University Grants Commission will be observed. The programme is presented in two sets of one hour duration each every day from 1.00 p.m. to 2.00 p.m. and 4.00 p.m. to 5.00 p.m. The programme is available on the TV Network throughout the country.

Ist Transmission

1.00 p.m. to 2.00 p.m.

15.12.93

"Natural Gas in Industry"

"Sea Cucumber"

"Gandhi as He Was and His Relevance"

16.12.93

"Microwave Cooking"

"English Romantic Poetry-II"

"Paul Emile Victor : Explorer of the Polar Region"

17.12.93

"Ecology of River Ganga-I"

"India in 2000 A.D.-II"

"Paper Boats in Turbulent Streams"

18.12.93

"Science of Musical Instruments — Tabla"

"Finding Oneself with Sue Weston-II"

"The Week Ahead"

19.12.93

No Telecast

20.12.93

"Oscillation — Amplitude Response as a Function of Frequency"

"Humus Culture"

"Crossbred Cow"

21.12.93

"Naturopathy as an Alternative"

"Courseware"

IInd Transmission

4.00 p.m. to 5.00 p.m.

15.12.93

"Flexible Manufacturing System"

"Indian Historiography-I
Oriental and Administration School"

"The Battle for life"

16.12.93

"Algorithms"

"Glimpses of Ladakh-II"

"Shakespeare — As we like him"

17.12.93

"Environment Education : In and Across the Borders-III"

"Starfinder-VII. Gravity in Space"

"The Week Ahead"

18.12.93

No Telecast

19.12.93

No Telecast

20.12.93

"Protection of Food Stocks in Tropical Region"

"The People on Market Street -VII, Property Rights and Pollution"

21.12.93

No Telecast

News from Abroad

Computer Software Substitutes Human Blood

Human blood, an essential ingredient in many biological experiments, has been eliminated from the teaching program at Perth's Curtin University, where two lecturers have developed a computer software substitute for the real thing.

With the risks posed by AIDS and other blood-based diseases, it has become increasingly hard for academic institutions to manage the traditional practice of blood use in experiments and tests. Such risks no longer exist due to a multimedia, interactive system called the Osmosis Program devised by Georgina and Sue Fyfe, sisters who lecture in the Department of Human Biology.

The program is a component of a first year Human Biology study unit dealing with the concepts of osmosis — the movement of fluid across a cell's membrane — an understanding of which is essential to students who later will be involved in administering drips or oral fluids to patients. The unit is essential in the teaching of nursing, therapy, pharmacy and medical students.

With about 1000 students taking the unit last year, Curtin staff found it costly and time consuming to obtain sufficient blood samples and ensure each met stringent safety standards. Ms Georgina Fyfe said with staff spending so much time monitoring the blood's purity, it had become difficult to teach the concepts involved in the experiments.

The Osmosis Program simulates on screen the practical laboratory experiment which tests blood cell reactions to various concentrated solutions.

In the conventional, physical experiment, the blood cell reaction is clearly visible, the fluid taking on a stronger colour if the cell has burst and red haemoglobin released and dissolved. If the cell is intact and the haemoglobin retained within the cell, the fluid takes on a cloudy appearance.

The Osmosis Program can replicate the results on screen by the student keying in a drop of "blood" and placing it into one of three "test tubes", each containing different solutions.

The program has been constructed in three modules. There is a background tutorial which allows remedial help and self-testing; the laboratory class which mimics aspects of the practical experiment; and a post-laboratory tutorial in which students analyse results and make decisions on the data they have collected.

As well as avoiding the difficulties and potential dangers of working with real blood samples, students also benefit from being able to work at their own pace and spend more time learning the unit's concepts.

Polymer Promises to Boost Drugs

Scientists at the universities of Nottingham and Leicester have isolated an organic polymer which promises to offer a means of dramatically increasing the efficacy of medicinal drugs.

Researchers at the National Centre for Macromolecular Hydrodynamics have been analysing ways in which drugs taken orally can be absorbed more effectively.

Dr. Arthur Rowe, director of the Leicester arm of the centre, said: "Most prescribed drugs just whizz through the gut and are excreted. This is wasteful and furthermore may cause side effects such as upsets of the bowel".

He said that pharmaceuticals firms are keen on finding ways of targeting the drug at the small intestine, the primary region for absorption. Attention has focused on studying a range of compounds that might act as drug "carriers".

Dr Rowe believes that the work will lead to drug carriers being made available by the end of the decade.

The work at the centre has been boosted by a £138,000 grant from the Science and Engineering Research Council, part of a £400,000 new rolling grant to fund the research.

Other projects, the money will support, include studies of how heart muscles repair themselves and ways in which toxins from bacteria damage body tissue.

THESES OF THE MONTH

A list of doctoral theses accepted by Indian Universities

BIOLOGICAL SCIENCES

Environmental Sciences

1. Ashesh Kumar. Bio amplification of selected heavy metals in an ecosystem. Roorkee.

2. Mitra, Sukanta. Some aspects of ecology of walls at Visakhapatnam. Andhra.

Biochemistry

1. Deepa Rani, K R. Effect of exposure of the mother to cigarette smoke on the metabolism of lipids and macromolecular components in the young ones using experimental animals. Kerala. Dr P L Vijayammal, Reader, Department of Biochemistry, University of Kerala, Kariavattom.

2. Mathews, Mary Susan Impact of hormones on malathion toxicity in pregnant rats. Kerala Dr K Saraswathy Devi, Reader, Department of Biochemistry, University of Kerala, Kariavattom

3. Mohankumar, C. Histochemical and biochemical studies of oilpalm fruit, *Elaeis guineensis*. Kerala. Dr R Kaleysa Raj, Prof and Head, Department of Biochemistry, University of Kerala, Trivandrum and Dr C Arumughan, Scientist E, Department of Biochemistry, Regional Research Laboratory, Pappanamcode, Trivandrum

4 Naik, Pradeep. Biochemical studies in ischaemic heart diseases. Osmania

5 Pawar, Yalla Masu Trace elements in human health and disease. Shivaji Dr S K Ahaley, Department of Biochemistry, Govt Medical College, Miraj, Dist Sangli

6 Radhakrishna Pillai, G Studies on ascorbic acid 2 sulphate. Kerala Dr M Indira, Technical Officer, Department of Biochemistry, University of Kerala, Kariavattom and Dr P L Vijayammal, Reader, Department of Biochemistry, University of Kerala, Kariavattom.

7. Suresh Kumar, J S Metabolism of lipids and glycoconjugates in myocardial infarction associated with diabetes. Kerala. Dr Venugopal P Menon, Reader, Department of Biochemistry, University of Kerala, Kariavattom.

8. Verma, Renu. Development of male specific DNA and immunological probes. JNU. Dr Gurpreet Singh.

9. Vijaya Kumar, K. Biochemical studies in essential hypertension with particular reference to free radicals, essential fatty acids and prostaglandins. Osmania

Microbiology

1. Ashok Kumar. Studies on the microbial production of fuel gases from apple waste and substrates. Roorkee.

2 Attar, Yasmin Chand. Microbiological aspects in the enhancement of biomass digestion for the generation of biogas. Shivaji. Dr M R Dhawale, Shivsadan, Renewable Energy Research Insitute, 192/3, Industrial Estate, Sangli.

3. Jahiyani, Kamala Lekhraj. Mircobial degradation stabilization of crude oil sludges generated from crude oil producing/processing industries. Nagpur. Dr S R Joshi and Dr S R Wate, National Environmental Engineering Research Institute, Nagpur.

Botany

1. Balasundaran, M. Studies on the actinomycetes from the rhizosphere soils of some crop plants. Kerala. Dr T A Abraham, Reader, Department of Botany, University of Kerala, Kariavattom.

2. Charjan, Sanjivkumar Uttamrao. Evaluation of seed germination, viability, vigour, field emergence, longevity and cytology in soybean, *Glycine max* L safflower, *Carthamus tinctorius* L to sunflower, *Helianthus annus* L and sesame, *Sesamum indicum* L. Nagpur. Dr J L Tarar, Department of Botany, Institute of Science, Nagpur.

3 Gupta, Mahendra Kumar. Post impoundment limnological studies of river Narmada, Mandla to Jabalpur. Durgawati. Dr P K Singhal, Department of Bio-Science, Rani Durgawati Vishwavidyalaya, Jabalpur.

4. Harsimran Kaur Simulating growth and yield of Indian mustard, *Brassica juncea* L in Punjab. PAU.

5 Khanna, Uma Kumari. Genetic variability in rice, *Oryza sativa* L. Kurukshetra.

6. Nath, Mina Ram. Physiological and biochemical studies in relation to certain orchid species cultured *in vitro*. Gauhati. Dr P C Deka, Prof, Department of Agriculture, Biotechnology Programme, Assam Agriculture University, Jorhat and Prof C L Boissya, Department of Botany, Gauhati University, Guwahati.

7. Parmar, S S. Ecology of intertidal algae at Veraval-II: Functional aspects. Saurashtra Dr M S Murthy, Department of Bio-Sciences, Saurashtra University, Gujarat.

8. Premakumari, D. Variability correlations and path coefficient analysis for yield in relation to anatomical characters in *Hevea brasiliensis* (Willd ex Adr de Juss) Muell Arg. Kerala. Dr A O N Panikkar, Joint Director, Rubber Research Institute of India, Kottayam.

9. Punjrath, Baljit. Biochemical, physiological and morphohistogenic studies in niger oil seed plant *Guizotia abyssinica* Cass. Patel. Prof J A Inamdar (Retd), and Dr (Mrs) Kiran Kalia, Department of Bio-Sciences, Sardar Patel University, Vallabh Vidyanagar, Gujarat.

10. Puri, S Jyoti. Tissue culture studies in *Gloriosa* L. Shivaji. Dr B A Hegde, Prof, Department of Botany, Shivaji University, Kolhapur.

11. Shukla, Virendra Kumar. Biomass productivity of paddy, *Oryza sativa* L as affected by planting pattern, weed management and nitrogen manuring. Durgawati. Dr R C Rajak, Department of Bio-Science, Rani Durgawati Vishwavidyalaya, Jabalpur.

12. Thomas, Jacob. Antimitotic and clastogenic effects of five therapeutic alkaloids. Kerala. Dr J Stephen, Reader, Department of Botany, University of Kerala, Thiruvananthapuram.

Agriculture

1. Ekshinge, Baban Sadashivappa. Studies on growth, yield and quality of safflower varieties by advancing fertilizer application under rainfed conditions. Marathwada Agrl. Dr S V Raikhelkar, Head (Retd), Department of Agronomy, Marathwada Agricultural University, Parbhani.

2. Kansal, Sandeep. Studies on sclerotium root rot of yellow horned poppy. YS Parmar. Dr J L Kaul, Prof, Department of Plant Pathology, College of Horticulture, Nauni, Solan (HP).

3. Khargakharate, Vinodkumar Gangadhar. Varietal-cum-plant population studies in soybean, *Glycine max* (L) Merrill under protective irrigation. Marathwada Agrl. Dr V G Kurlekar, Chief Agronomist, Cropping System Research Centre, Marathwada Agricultural University, Parbhani.

4 Pawar, Kisan Pandurang. Studies on nitrogen economy in rabi sorghum under no irrigation and optimum irrigation preceded by kharif legumes. M P Krishi. Dr B A Koregave, Prof (Retd), Department of Agronomy, College of Agriculture, Pune.

5. Raj Kumar. Effect of conditioning on the performance of *Bauhinia variegata* Linn seedlings. YS Parmar Dr P S Chauhan, Department of Silviculture and Agroforestry, College of Forestry, Nauni (Solan) HP

6 Ranpise, Shrimant Anna Assessment of kaghzi lime, *Citrus aurantifolia* Swingle selections for yield and quality. M P Krishi Dr U T Desai

7 Sawate, Arvind Raghunathrao. Studies on structure-function relationship of galactomannan of sesbania, *Sesbania bispinosa* and its exploration in baked products. Marathwada Agrl. Dr D B Wankhede, Prof and Head, Department of Bio-Chemistry and Applied Nutrition, College of Agricultural Technology, Parbhani

Zoology

1. Gopakumar, B. Biology and behaviour of the teak pest, *Entectona machaeralis* Walker (Lepidoptera : Pyralidae). Kerala Dr V K K Prabhu, Prof, Department of Zoology, University of Kerala, Kariavattom.

2. Jaya Prakash, R. Studies on some aspects of antennal sensilla in *Opisina arenosella* Walker (Lepidoptera : Xyloryctinae); *Oryctes rhinoceros* (Coleoptera : Scarabaeidae) and mating behaviour in *Opisina*. Kerala. Dr V K K Prabhu, Prof, Department of Zoology, University of Kerala, Kariavattom.

3. Lakshmi, P. Haematological studies on certain teleosts. Kerala. Dr S Radhakrishnan, Lecturer, Department of Aquatic Biology and Fisheries, University of Kerala, Trivandrum.

4. Miranda, Mary Teresa P. A study on the biology and ecology of termites with special reference to *Odontotermes brunneus* Hagen (Isoptera : Termitidae). Kerala. Prof G K Karnavar, Head, Department of Zoology, University of Kerala, Kariavattom.

5. Pillai, Sirimavor. Studies on autonomic nervous regulation of kidney metabolism in pigeons and rats. Baroda.

6. Ramachandran, K K. Certain aspects of ecology and behaviour of the Malabar Giant squirrel, *Ratufa indica* Maxima. Kerala Dr M Balakrishnan, Reader, Department of Zoology, University of Kerala, Kariavattom.

7 Ramanna, N. Studies on the effect of pesticides on changes of organic constituents in larvae of the coconut beetle, *Oryctes rhinoceros* (Coleoptera : Scarabeidae). Bangalore. Dr S Krishnan, Department of Zoology, Bangalore University, Bangalore.

8. Sherly, P S P Soman. Studies on fish brain in relation to feeding. Kerala. Dr P K Abdul Azis, Reader, Department of Aquatic Biology and Fisheries, University of Kerala, Thiruvananthapuram.

9. Shobha Rani, K. Comparative study of biochemical variations during ovarian growth and early embryogenesis of an insect and a crab. Kakatiya Dr V Lakshmipathi, Department of Zoology, Kakatiya University, Warangal.

10. Srivastava, Sheela. Cytological study of male germ cell cycle in four species of phytophagous coleopteran beetles. Ghasidas. Dr C K Tiwari, C M D College, Bilaspur.

11. Upadhyaya, Som Nath. Studies on adoption of improved piscicultural techniques and their implications on economic development of rural pisciculturists of the Brahamaputra Valley. Gauhati Dr A Dutta, Reader, Department of Zoology, Gauhati University, Guwahati.

12. Venugopal, G Effect of organophosphorus pesticides on some aspects of chemoreception in Indian major carps, *Catla catla* and *Labeo rohita*. Osmania.

13. Walter, Alexander. Radiosensitizing effect of largectil, chlorpromazine hydrochloride on fibrosarcoma in Swiss albino mice. Kerala Dr J Stephen, Reader, Department of Botany, University of Kerala, Thiruvananthapuram.

Medical Sciences

1. Rajendran, R. Epidemiological, biochemical immunological and ultrastructural studies on the changes in *Mucosa* associated with oral submucous fibrosis (OSMF). Kerala. Dr P I John, Joint Director of Medical Education (Retd), 'Puthusseril', Navarangom, Medical College, Trivandrum.

Veterinary Sciences

1. Abdul Mujeer, K. Factors influencing the hatching performance of Japanese quail eggs. TNVAS. Dr D Narahari, Prof, Department of Poultry Science, Madras Veterinary College, Madras.

2. Baghel, Krishna Kumar Singh. Studies on production efficiency of mini egg type layer as compared with normal bodied white and brown commercial flocks. JN Krishi.

3. Balasubramanian, J. Seroepidemiology and experimental studies in ovine leptospirosis. TNVAS. Dr J Ramkrishna, Assoc Prof, Department of Preventive Medicine, Madras Veterinary College, Madras.

4. Chandrahasan, C. Characterization and *in vitro* maturation of follicular oocytes in buffaloes, *Bubalus bubalis*. TNVAS. Dr J Rajasekaran, Prof and Head, Department of Obstetrics and Gynaecology, Madras Veterinary College, Madras.

5. Chandrasekaran, D. Poultry droppings as a feed resource for sheep. TNVAS. Dr R Natanam, Prof and Head, Department of Communication Centre and Entrepreneurship, Madras.

6. Ganesan, P I. Immune response studies in layer poultry vaccinated against new castle disease. TNVAS. Dr I Ramkrishna, Assoc Prof, Department of Preventive Medicine, Madras Veterinary College, Madras.

7. Gupta, Ram Das. Estimation of genetic variances from diallel crossing for different periods within laying cycle and over generations for traits of economic importance. J N Krishi.

8. Jadhav, Kirtikumar Mafatlal. Study on canine epilepsy. TNVAS. Dr V Gnanaprakasam, Vice-Chancellor, Tamilnadu Veterinary and Animal Sciences University, Madras.

9 Karunamoorthy, G. Bionomics and biological control of muscids of veterinary importance. TNVAS Dr D Jeyaseelan Chellappa, Prof and Head, Department of Parasitology, Veterinary College and Research Institute, Namakkal

10 Manohar Paul, W Studies on *Staphylococcus aureus* of bovine mastitis origin. TNVAS. Dr R A Venkatesan, Prof and Head, Department of Microbiology, Madras Veterinary College, Madras

11. Mukherjee, Rudradeo. Comparative evaluation of colonic anastomosis by monolayer appositional techniques alongwith appraisal and management of post operative abdominal adhesion in canine. Birsa Agri.

12. Nambi, A P. Assessment of hepatic metabolism in pre and post hepatic disorders. TNVAS. Dr V Gnanaprakasam, Vice-Chancellor, Tamilnadu Veterinary and Animal Sciences University, Madras.

13. Naresh Kumar, C. Studies on mozzarella cheese. TNVAS. Dr M Mohamed Habibulla Khan, Director of Extension Education, Tamilnadu Veterinary and Animal Sciences University, Madras.

14. Sivaselvam, S M. Studies on cryopreservation of buck semen. TNVAS. Dr N Natarajan, Dean, Madras Veterinary College, Madras.

15. Totey, S M. Studies on maturation, fertilization and development *in vitro* of buffalo oocytes. JNU. Dr Gurpreet Singh.

16. Umrikar, Uday Dettatraya. Karyological studies on sheep and goats. TNVAS Dr N Natarajan, Dean, Madras Veterinary College, Madras.

17. Venukopalan, K. Studies on package of practices followed in commercial hatcheries and the influence of strain and season on the cost of production of hatching eggs and day old chicks. TNVAS Dr V Sundararasu, Director of Research, Tamilnadu Veterinary and Animal Sciences University, Madras

18. Yadava, Rajendra. Biotyping and serotyping of *Bacillus cereus* isolated from fried rice and chawmin. Birsa Agri.

CURRENT DOCUMENTATION IN EDUCATION

A list of select articles culled from periodicals received in AIU Library during November 1993

EDUCATIONAL PHILOSOPHY

Peukert, Helmut. Present challenges to the educational theory of modernity. Education 47, 1993, 7-24

Scott, David K and Awbrey, Susan M. Transforming scholarship. Change 25(4), 1993, 38-43.

EDUCATIONAL PSYCHOLOGY

Falchikov, Nancy. Attitudes and values of lecturing staff : Tradition, innovation and change. Hr Edn 25(4), 1993, 487-510.

Meyer, Ernst. Learning in groups : Learning in freedom. Education 47, 1993, 44-62.

Om Prakash, S Psychological symptoms amongst untouchable students of IITs : Challenge for the technical educational planners. J of Ednl Plann and Admn 7(2), 1993, 165-80.

EDUCATIONAL SOCIOLOGY

George, P P. The relevance of today's education for youth. New Frontiers in Edn 23(2), 1993, 175-202.

Lovett, Clara M. American professors and their society: To affect intimately the lives of the people Change 25(4), 1993, 26-37.

Pattanaik, B K. Education for rural development Progress of Edn 68(2), 1993, 36-7, 50.

EDUCATIONAL PLANNING

India. Ministry of Human Resource Development, National Advisory Committee Learning without burden : Report. New Frontiers in Edn 23(3), 1993, 368-95.

Syam Sunder Rao, A POA 1992 : An analysis. Progressive Ednl Herald 7(4), 1993, 15-9.

EDUCATIONAL ADMINISTRATION

Chevaillier, Thierry and Paul, Jean-Jacques. University-industry relations in France. Hr Edn Q 47(1), 1993, 41-51.

Clayton, Marlene. Towards total quality management in higher education at Aston University : A case study. Hr Edn 25(3), 1993, 363-71.

D'Souza, Lena. Managing performance appraisal in educational organisations. Progressive Ednl Herald 7(4), 1993, 26-8.

Doherty, Geoffery D. Towards total quality management in higher education: A case study of the University of Wolverhampton. Hr Edn 25(3), 1993, 321-39.

Fairweather, James S. Faculty rewards reconsidered: The nature of trade offs.'Change 25(4), 1993, 44-7.

Hindle, Winston R. The business-higher education link: Consider the possibilities. Ednl Record 74(3), 1993, 33-8.

Hutton, George. A new forum for business/higher education interaction : The Australian business/higher education round table. Hr Edn Q 47(1), 1993, 52-60.

Lysons, Art. The typology of organizational effectiveness in Australian higher education. Research in Hr Edn 34(4), 1993, 465-88.

Metha, Arun C. A note on educational statistics in India. J of Ednl Plann and Admn 7(1), 1993, 105-17.

Seethi, K M. Universities in a melting-pot. Mainstream 31(49), 1993, 11-4

TEACHERS & TEACHING

Apel, Hans-Jurgen. Teacher training in theory and practice Education 47, 1993, 25-43.

Brinko, Kathleen T. The practice of giving feedback to improve teaching: What is effective? J of Hr Edn 64(5), 1993, 574-93.

Joseph, K S. Teacher in a multicultural society. New Frontiers in Edn 23(2), 1993, 241-49

EDUCATIONAL RESEARCH

Chan, Susy S. Changing roles of institutional research in strategic management. Research in Hr Edn 34(5), 1993, 533-49.

EDUCATIONAL EVALUATION

Garg, V P Comprehensive continuous evaluation · A SWOT analysis. New Frontiers in Edn 23(3), 1993, 350-7.

Yen, Wendy M. Scaling performance assessments : Strategies for managing local item dependence J of Ednl Measurement 30(3), 1993, 187-213

ECONOMICS OF EDUCATION

Ehrenberg, Ronald G and Murphy, Susan H. What price diversity? Change 25(4), 1993, 64-73.

Mehta, B C. Financing of higher education. J of Ednl Plann and Admn 7(1), 1993, 63-74.

Pritchard, Rosalind M O. Mergers and linkages in British higher education. Hr Edn Q 47(2), 1993, 79-102.

Upendranath, C. Educational finances in Andhra Pradesh. J of Ednl Plann and Admn 6(4), 1992, 401-5.

Wallace, Thomas P. Public higher education finance : The dinosaur age persists. Change 25(4),1993,56-63.

VOCATIONAL EDUCATION

Boreham, Nicholas C. Harnessing implicit knowing to improve medical practice. New Directions for Adult and Continuing Edn 55, (Fall) 1992, 71-8.

Jarvis, Peter. Learning practical knowledge. New Directions for Adult and Continuing Edn 55, (Fall) 1992, 89-95.

Klevans, Deborah R and others. Self-assessment : Helping professionals discover what they do not know. New Directions for Adult and Continuing Edn 55, (Fall) 1992, 17-27.

ADULT EDUCATION

Tisdell, Elizabeth J. Feminism and adult learning: Power, pedagogy, and praxis. New Directions for Adult and Continuing Edn 57, (Spring) 1993, 91-103.

Welton, Michael R. The contribution of critical theory to our understanding of adult learning. New Directions for Adult and Continuing Edn 57, (Spring) 1993, 81-90.

COMPARATIVE EDUCATION & COUNTRY STUDIES

Fishman, Sterling. After the wall : A case study of educational change in Eastern Germany. Teachers College Record 94(4), 1993, 744-60.

Maclean, Rupert. Innovations and reforms in schooling in Asia's developing countries. Prospects 22(3), 1992, 366-78.

INSTITUTIONAL PROFILE

Devadas, Rajammal P. Avinashilingam Institute for Home Science and Higher Education for Women. New Frontiers in Edn 23(3), 1993, 327-37.

Joseph, M. Gandhigram Rural Institute A profile New Frontiers in Edn 23(3), 1993, 342-9.

UNIVERSITY OF LUCKNOW

ADVERTISEMENT NO. 7 1993

Applications for the following temporary posts should reach the Registrar, Lucknow University, Lucknow - 226007

TEMPORARY PROFESSORS (Rs. 4500-150-5700-200-7300)

One in Hindi (under two years P.G Diploma Course in Translation), One in Botany (Prof. R N. Kaul Chair in Plant Soil Relationship).

TEMPORARY READERS (Rs. 3700-125-4950-150-5700)

One in Arabic, One in Economics, One permanent in Physics (Specialisation in the field of theoretical Physics), One in Hindi (under two years P G. Diploma Course in Translation)

TEMPORARY LECTURER (Rs. 2200-75-2800-100-4000)

One in Public Administration

Qualifications for the above posts . As laid down in Lucknow University First Statute.

One Temporary Assistant Director Academic Staff College (Rs. 2200-75-2800-100-4000)

Qualification . As per qualification for the post of Lecturer in any subject.

The number of posts may vary. It is not necessary to fill any/all of the advertised posts. Prescribed application forms can be obtained by payment of Rs. 5/- or by sending a self addressed envelope (23 x 10) with postage stamps worth Rs. 10/- and a Bank Draft for Rs. 5/- payable on a Bank in Lucknow from the office of the Registrar, Lucknow University. Last date for submission of application with a Bank Draft of Rs. 25/- drawn in favour of the Registrar, Lucknow University, Lucknow is January 8, 1994.

REGISTRAR

CLASSIFIED ADVERTISEMENTS

DR. YASHWANT SINGH PARMAR UNIVERSITY OF HORTICULTURE AND FORESTRY

Nauni (Solan), H.P.

"Academic Branch"

Admission Notice

Applications (in triplicate) are invited upto 3-1-1994 for admission to Doctoral Programme in the discipline shown as under against each College for the Academic Session 1993-94 (2nd Semester) commencing from 13-1-1994.

I. College of Horticulture (Written Eligibility Test on 10-1-1994 at 11.00 A.M. in the University Campus)

1. Fruit Culture & Orchard Management
2. Post Harvest Technology
3. Vegetable Crops
4. Fruit Breeding
5. Entomology
6. Plant Pathology

Interview on 11-1-1994 from 11.00 A.M. to 1.00 P.M. in the University Campus

II College of Forestry (Written Eligibility Test on 10-1-1994 at 11.00 A.M. in the University Campus)

1. Tree Management
2. Silviculture & Agroforestry (Silviculture)
3. Forest Products
4. Social Sciences (Agril. Economics)

Interview on 11-1-1994 from 2.00 P.M. to 5.00 P.M. in the University Campus

Eligibility

a) M.Sc. in the concerned discipline from a recognized University with an OGPA of 7.00/10.00 (3.20/4.00) or its equivalent under course credit system or at least 65% marks in annual system of examination

b) For Forestry disciplines, M.Sc. with AIFC or SFS 2-year diploma course having the above OGPA at the M.Sc. level will also be eligible

OR

c) Degree of a Foreign University with at least 'B' Grade or its equivalent as recognized by the Academic Council.

The Interview shall be subject to clearance of written test as laid down in the Prospectus.

GENERAL INFORMATION FOR ALL

i) The minimum qualifying marks is relaxable by 5% in case of SC/ST and in-service nominees.

ii) 22.5% of the total seats shall be reserved for candidates belonging to SC (15%) and ST (7.5%).

iii) Prospectus-cum-Admission Form can be obtained from the Office of the Registrar on payment of Rs. 20.00 at the counter and Rs 30/- by post through Crossed IPOs in the name of Comptroller of the University in which exhaustive details about admissions are available.

NO MONEY ORDERS/CHEQUES ARE ACCEPTABLE.

iv) No separate letter for written test and interview will be issued.

v) Candidates should appear in the Written Test and attend Interview at their own expenses on the prescribed date and time and bring original certificates with them.

vi) The list of candidates selected and those placed on the waiting list for admission to Doctoral Programme will be notified on 12-1-1994.

Bharat Bhushan
REGISTRAR

INDIAN SCHOOL OF MINES DHANBAD

Indian School of Mines (Deemed University under UGC Act) invites applications for the following posts :

1. Professors (4 Posts) Rs. 4500-7300) (Upper Age limit 50 yrs)

One each in the areas of (a) Engineering Geology; (b) Applied Mathematics; (c) Applied Chemistry; and (d) Computer Engg./Computer Applications.

Qualification . Ph.D. with First Class Bachelor's or Master's degree in Engg./Tech. or in M.Sc. in appropriate branch. He must be an eminent scholar with published work of high quality research and must possess at least ten years distinguished experience in teaching/industry/research, out of which 5 years must be at the level of Asstt. Professor or equivalent.

2. Professor of Continuing Education (1 Post) (Rs. 4500-7300) (Upper Age limit 50 yrs)

Qualification : Same as above, but in addition he must have the ability to liaise with industries/institutions in conducting in/off campus courses and also to procure and coordinate consultancy projects.

3. Medical Officer (1 Post) and Lady Medical Officer (1 Post) (Rs. 2200-4000 + NPA)

Qualification : MBBS degree with 3

REGIONAL ENGINEERING COLLEGE

WARANGAL - 506 004 (A.P.)

Advertisement No. 4/93

Applications in the prescribed form are invited for the post of PRINCIPAL on or before 31-12-93.

N.B. (The appointment of PRINCIPAL will be on contract basis for an initial tenure of three years with possibility of renewal depending upon the merits of the case, unless otherwise decided by the Board).

Scale of pay . Rs. 6300-200-7300

Application forms and details of qualifications and experience required for the post can be obtained from the Registrar, by sending a crossed IPO/DD for Rs. 100/- drawn in favour of the "PRINCIPAL, R.E.C., Warangal" payable at R.E.C. Post Office, Warangal-4/State Bank of Hyderabad, R.E.C Branch, Warangal-4 along with a self-addressed stamped envelope for Rs. 3/-.

Director of Technical Education
Government of Andhra Pradesh
V Floor, B.R K.R. Building
Secretariat Road
HYDERABAD - 500 029

years experience in a good Hospital/Organization after completion of internship.

4. Assistant Registrar (Rs. 2200-4000)

Qualification : A postgraduate degree with at least 55% marks or its equivalent grade with 5 years experience of working in a University office or institution of repute in the areas of Administration, Accounts, Audit, Academic.

5. Assistant Librarian (Rs. 2200-4000)

Qualification First or Second Class Master's degree in Library Science/Information Science/Documentation or an equivalent Professional degree with at least 55% marks or its equivalent grade plus a consistently good academic record;

OR

Master's degree in Arts/Commerce/Science or equivalent degree with at least 55% marks or its equivalent grade with First or Second Class Bachelor's degree in Library Science/Information Science/Documentation or an equivalent professional grade.

6. Junior Engineer (Rs. 1640-2900)

Qualification : Degree or Diploma in Electrical Engg with 3 years professional experience in the maintenance of power supply in campus.

General Information : Those who have applied for some of the above posts against earlier advertisement No. 420001/92-Estt dated 23rd March 1992 need not apply. However, they may send updated biodata mentioning details of post applied for earlier The number of posts are subject to modification at the time of selection.

Prescribed application form and other details may be obtained from the office of the Registrar by sending a crossed IPO of Rs. 20/- in favour of Registrar, Indian School of Mines, Dhanbad-826004. Last date of issue and acceptance of completed applications is **January 24, 1994.**

Canvassing in any form will be treated as disqualification.

Gurdayal Prasad
REGISTRAR (Actg)

ST. XAVIER'S COLLEGE FOR WOMEN

ALUVA

WANTED

Female Lecturers (Both Community and Open Quota) for the vacancies likely to arise in English and Political Science subject to Government, University and U.G C. norms and regulations.

Age limit : As per Government rules

Application forms can be obtained from the College Office on payment of Rs. 100/-. Apply within 30 days of this notification to . The Manager, St Xavier's College for Women, Aluva-683101, Kerala, S India.

MANAGER

LATEST EDITION

UNIVERSITIES HANDBOOK – 25th Edition

Sallent Features

Contains information covering all the Indian Universities including agricultural universities, institutes of national importance (including IITs) and deemed to be universites on following heads of information :

* Officers & Deans of Faculties;
* Library & Research Facilities;
* Scholarships and Fellowships;
* Academic year – last date for admissions and the approximate dates of examinations;
* Courses of Studies;
* Minimum requirements for admission to each course, duration and the subjects of study for each course;
* Names of Professors and Readers/Assistant Professors together with their academic titles department-wise with specialisation;
* Names of Colleges together with names of Principals and Heads of Postgraduate Departments in Colleges;
* Statistics on examination results.

Introductory chapter on overview of the University System in India.

Map showing location of universities.

Deluxe Binding with carton — Price : (Indian Edition) Rs. 1000 00

Address Enquiries to :

Deputy Secretary (Publications)
Association of Indian Universities
AIU House, 16 Kotla Marg, New Delhi-110 002
Telephones : 3310059, 3312429, 3313390, 3312305
Telex : 31-66180 AIU IN   GRAM : ASINDU

Published by SUTINDER SINGH, on behalf of the Association of Indian Universities, AIU House, 16 Kotla Marg, New Delhi-2.
Grams: ASINDU. Phones: 3310059, 3312305, 3312429, 3313390, 3323097 and 3712435. Telex : 31-66180 AIU IN
Printed by Navchetan Photoset (P) Ltd. at Navchetan Printers, 1-E/2, Jhandewalan Extension, New Delhi-110055. Tel. 5291.